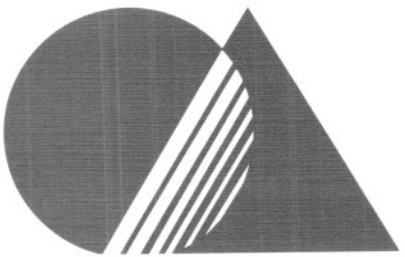

OATES ASSOCIATES

BRIDGE CONDITION REPORT
STRUCTURE NUMBER 027-0040

FINAL REPORT

FAP ROUTE 798
SECTION 107BR-1
FORD COUNTY
P-93-064-02

ILLINOIS ROUTE 115
OVER DRAINAGE DITCH

Prepared for:

Illinois Department of Transportation
District 3
Ottawa, Illinois

Prepared by:

Oates Associates, Inc.
Eastport Business Center 1
100 Lanter Court, Suite 1
Collinsville, IL 62234
Phone: (618)345-2200
Email: oai@oatesassociates.com

Oates Project Number 22041

June 2004

Illinois Department of Transportation

Memorandum

To:	John P. Kos	Attn: Thomas R. Sancken
From:	Ralph E. Anderson	By: Todd E. Ahrens
Subject:	BRIDGES AND STRUCTURES	Todd E. Ahrens
Date:	July 27, 2004	

FAP Route 798
Section 107BR-1
Ford County

P-93-064-02
SN 027-0040 (Existing)

IL Route 115 over tributary of North Fork Vermilion River

We have reviewed the Bridge Condition Report (BCR) submitted with your memorandum dated June 29, 2004. The BCR recommends complete structure replacement using stage construction.

After reviewing the BCR, we have the following comments:

1. Based on the deteriorated condition, and low ratings, we agree with your recommendation of complete replacement. Stage construction appears feasible.

2. We concur with the proposed improved bridge clear width of 32'-0". Replacement structure type, length, and number and location of piers (if required) will be determined during the Type, Size, and Location (TSL) plan phase based on the results of a hydraulic analysis.

3. Please notify your District Geotechnical Engineer that new boring data will be required at this structure. Our Foundations and Soils Unit can be contacted if assistance is needed regarding the subsurface exploration requirements or if any existing boring or foundation data is desired.

Subject to the above comments, the Bridge Condition Report is approved. A TSL plan, structure report, proposed cross section and proposed plan and profile will be required for this project.

GGE/mrc2034
cc- John P. Kos/Attn: Terry McCleary

Recorded in ACCESS 8/3/04

Copy to McCarter SF 8/4/04
" Brayboy SF 8/4/04
" ~~Gates~~ Oates ____
" McCleary ____

TABLE OF CONTENTS

APPENDICIES

1. GEOGRAPHICAL AND ADMINISTRATIVE DESCRIPTION

The existing structure, Structure Number 027-0040, is located in Ford County, Illinois approximately 3.38 miles south of U.S. Route 24. The structure carries Illinois Route 115 (FAP Route 798) over a drainage ditch. The centerline of the existing bridge is at Station 178+88. See Exhibit A1 for a Location Map.

Illinois Route 115 carries two lanes of traffic and is designated as a Class II truck route. The traffic data is as follows:

Class	Minor Arterial (Rural)
ADT	600 (2001) 900 (2023)
ADTT	78 (2001) 117 (2023)
DHV (10% ADT)	60 (2001) 90 (2023)
Design Speed	55 mph
Posted Speed Limit	55 mph
Passenger Vehicles	76.6 %
Single Units	12.7 %
Multiple Units	10.7 %

Structure number 027-0040 was constructed in 1929 and is a single span reinforced concrete slab bridge with closed concrete abutments supported on timber piles. The structure is approximately 36'-3" feet in width. There are no expansion joints at the ends of the bridge.

From the February 20, 2003 Illinois Structure Information System Master Report, the following information is summarized:

Sufficiency Rating	66.8
HS Truck Inventory Rating	17.0 (30.6 tons)
HS Truck Operating Rating	33.2 (59.8 tons)

In 1998, this structure was investigated for load restriction posting. According to an Overload Investigation Memorandum from the Bureau of Bridges and Structures dated February 17, 1998, this bridge is rated for legal loads only due to deficiencies in condition of structural members.

Refer to Appendix B for a copy of the Bridge Inspection Report, MMIS inventory data and February 17, 1998 Overload Investigation Memorandum.

2. PHYSICAL DESCRIPTION OF EXISTING STRUCTURE AND ROADWAY

The existing superstructure is a single span reinforced concrete slab with a bituminous overlay. The bridge measures approximately 30'-3 ¾" from back to back of closed concrete abutments and has 30° right forward skew.

The existing deck measures approximately 32'-9" between curbs and 33'-11" between bridge rails. The overall width of the existing deck is 36'-3". The deck cross section consists of a concrete slab with a thickness varying from 17 ½" at the curb line to 21" at the centerline. The structure was constructed with a 4" concrete wearing surface and currently has a bituminous overlay. Concrete bridge rails with steel plate beam guardrail exist along each shoulder. Deck drainage originally consisted of 3" diameter formed openings along the curb line but have been replaced with 4"x12" aluminum deck drains.

The superstructure bears directly on the abutment walls. The reinforced closed concrete abutments are monolithic with the vertical cantilever wingwalls and bear on two rows of untreated timber pile. According to the original drawings, the piles are twelve-inch diameter and approximately 20 feet long. The piles are not battered.

The approach roadway consists of two 9-foot PCC lanes with 3-foot full depth widening along each shoulder and a bituminous overlay. The shoulders consist of 3-foot wide aggregate wedges with 1-foot earth shoulders. The overall width of the approach roadway is approximately 32'-0". The approach roadway typical section is shown in Exhibit A2. According to the original plans, 18-foot long bridge approach pavement exists at each end of the bridge, however, the approach pavement joint measures 23' from the back of each abutment (measured along the roadway centerline).

Steel plate beam guardrail exists along each shoulder and is attached to the concrete bridge rail. The guardrail terminates at each free end with Type 1 end sections. There are no utilities attached to the structure.

According to the 1928 plans, the roadway and bridge are located on a tangent horizontal alignment and a flat vertical grade (0.00%). A vertical curve ends 188 feet north (downstation) of the structure with has entrance and exit grades of –2.00% and +0.00% respectively and a length of 400 feet. A field entrance exists north of the northwest guardrail terminal.

3. FIELD INSPECTION AND PHYSICAL EVALUATION

3.1 General

The bridge was inspected on April 14, 2004. Field inspection sketches showing existing conditions of the deck, abutments and wingwalls are shown in Appendix C. Site photographs of existing conditions are shown in Appendix D.

3.2 Superstructure

The Illinois Structure Information System Master Report rates the deck and superstructure at 4 – "Poor Condition – Advanced Deterioration".

3.2.1 Deck

The deck surface could not be inspected due to the bituminous overly and its condition could not be assessed. The overlay is in fair condition with slight rutting of the wheel lanes and some cracking. The deck drains are open and clear.

The underdeck is in poor condition. The surface is moist with efflorescence and rust stains, stalactites, tight map cracking and spalling with exposed reinforcement. Most of the spalling is isolated along the sides of the deck and around the deck drains. Efflorescence staining with stalactites occurs throughout the underdeck, which indicates the entire deck is saturated with salts.

3.2.2 Bridge Railing

The concrete bridge rail is in fair to poor condition with spalling at the base and near the ends. There is no sign of impact damage along the rail. The railing configuration and transition between the bridge railing and the steel plate beam guardrail does not meet current standards.

3.3 Approach Roadway

The approach roadway is in fair condition. Reflective cracks in the bituminous surface are forming in the pavement. Slight rutting is occurring in the wheel lanes along the overlay. The reflective cracks have been recently sealed. Bituminous patching/filling along the south abutment indicates the approach pavement is failing.

3.4 Abutments and Wingwalls

The Illinois Structure Information System Master Report rates the substructure 5 – "Fair Condition – Minor Section Loss, Cracks".

The abutment walls are in fair to poor condition with areas of map cracking, horizontal cracks with efflorescence, spalling at the wingwall corners and hollow areas near the top of the walls. Both abutment walls have significant moisture and efflorescence staining along the front face due to leaking of the top joint. The wingwalls are in fair condition with some cracks with efflorescence, spalling and a few hollow areas.

3.5 Waterway / General Hydraulics

The Illinois Structure Information System Master Report rates the waterway adequacy as 8 - "Equal to Present Desirable Criteria" and the channel and protection as 5 - "Fair Condition – Minor Section Loss, Cracks". The structure was analyzed for scour on March 28, 1995 and the Master Report rates scour as 5 – "Stable for Scour".

The structure is on a 30° right forward skew and is slightly misaligned with the channel. The creek flows from west to east and enters the structure at an approximately 25° skew, resulting in erosion near the northwest and southeast corners of the structure. The channel is well defined and is confined by moderately sloped banks. The banks appear stable with good vegetation cover.

A preliminary hydraulic report on this structure was completed in June 2004. The report states that the existing structure does not meet clearance and freeboard requirements. No clearance exists for the 50-year high water elevation and the superstructure is partially submerged at the 100-year high water elevation. A replacement structure with a 20' channel bottom, 2:1 side slopes and a 25° skew was analyzed in the report. The report states that the proposed structure provides a larger available opening area, does not increase the water surface profiles over the existing conditions and there is no history of detrimental flooding upstream of the structure.

4. SUMMARY STATEMENT AND PROPOSED SCOPE OF WORK

4.1 Summary

The superstructure is in poor condition. Significant spalls with exposed reinforcement exist near each fascia and around drains. Efflorescence staining with stalactites exist throughout the underdeck.

The substructure is in poor condition with efflorescence staining and cracking throughout, and spalling with hollow areas near the wingwall intersections.

The approach roadway is in fair condition with reflective cracking and some rutting of the wheel lanes. The guardrail end sections and bridge railing do not meet current standards.

The waterway and general hydraulics do not meet clearance and freeboard requirements. The existing opening provides no clearance above the 50-year high water elevation. The structure has a 30° skew and the creek approaches the structure at a 25° skew.

4.2 Recommendations

Because of the poor condition of the underdeck, the superstructure is in obvious disrepair. The abutments could be rehabilitated, but areas of partial repair would be large and its long term effectiveness would be questionable. It is recommended that the existing bridge be replaced with a new structure for the following reasons:

- The amount of estimated full depth repair exceeds the maximum allowed for deck rehabilitation. Replacement of the deck is required.
- The structure was constructed in 1929 and has not had significant rehabilitation work during its life. Significant repairs would be necessary to rehabilitate the substructure. Reuse of 75-year old bridge elements is not recommended.
- The existing structure is slightly misaligned with the creek and has no clearance above the design high water elevation. The replacement structure would have more efficient hydraulics.

Therefore, the superstructure and substructure would be completely removed and replaced. The new structure would consist of a 1'-3" thick (minimum) reinforced concrete deck superstructure supported on solid concrete piers and integral abutments with a 25° right forward skew. The bridge width face to face of Type F barriers would be 32'-0" (Figure 49-3I of the BDE Manual) and 35'-2" out to out of deck. New abutments would be located outside the existing abutments resulting in a bridge length of approximately 72'-0". The channel underneath the structure would consist of a 20-foot flat bottom with 2:1 side

slopes. The channel banks beneath the bridge will be protected with riprap. The proposed bridge drawing is shown in Exhibit E.

The total estimated construction cost for replacement is $612,000.

Raising the profile grade to provide a minimum of two feet of clearance above the high water elevation was considered (Figure 39-6A of the BDE Manual), however, this would result in significant roadway reconstruction. Therefore, it is proposed to maintain the existing profile grade across the structure, resulting in one foot of clearance above the design high water elevation. A request for a design exception would be required with this recommendation.

Bridge approach pavement will be constructed at each end of the bridge. All existing guardrail will be removed and re-erected. New traffic barrier terminals will be installed at the bridge parapet ends and at the guardrail ends, Type 6 and Type 1 (Special), respectively.

Staged construction is feasible but is subject to further evaluation during the preliminary engineering phase. Traffic control costs, time of construction and road user benefits may be the deciding factor when choosing an alternate. Economics should be evaluated considering the additional construction time and costs associated with stage construction versus closing the road and detouring traffic. Staged construction cross sections are shown in Appendix E.

4.3 Structural Investigation

The IDOT "Bridge Condition Report Procedures and Practices" states all structural elements recommended for reuse must be evaluated to determine if they can safely carry a HS20 loading under current design specifications. Since complete structure replacement is recommended (see 4.2 Recommendations), a structural investigation was not conducted.

APPENDIX A

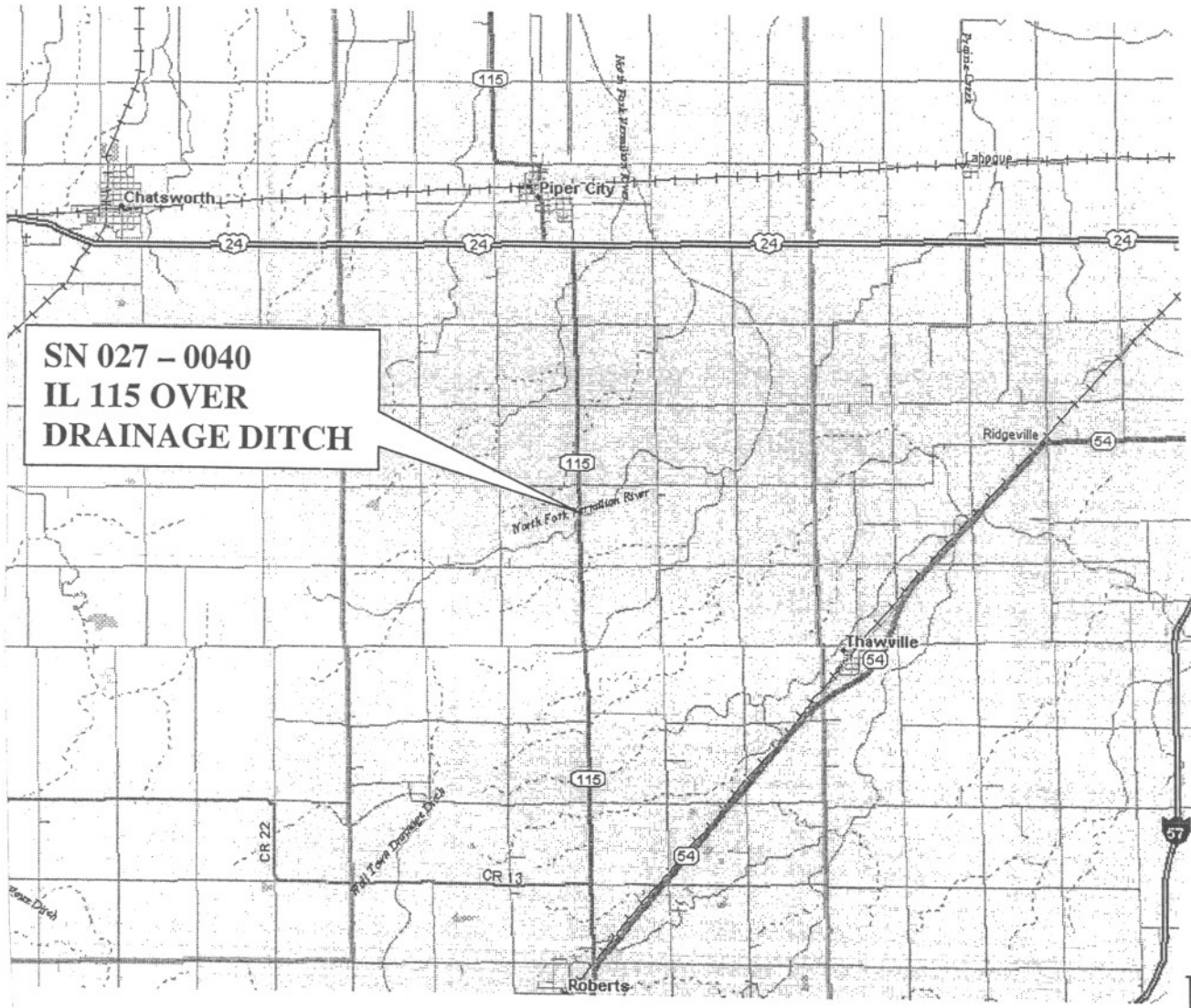
LOCATION MAP

EXISTING BRIDGE CROSS SECTION

APPROACH ROADWAY TYPICAL SECTION

EXISTING PLAN AND PROFILE

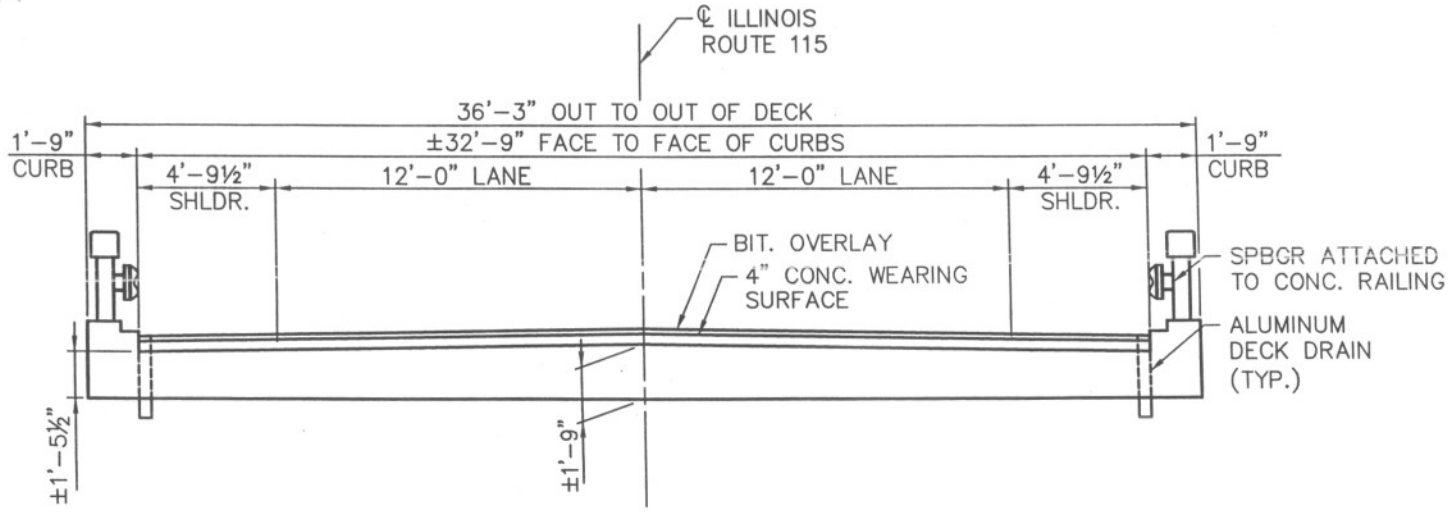
LOCATION MAP



3.4 MILES SOUTH OF US 24
IL 115 OVER DRAINAGE DITCH

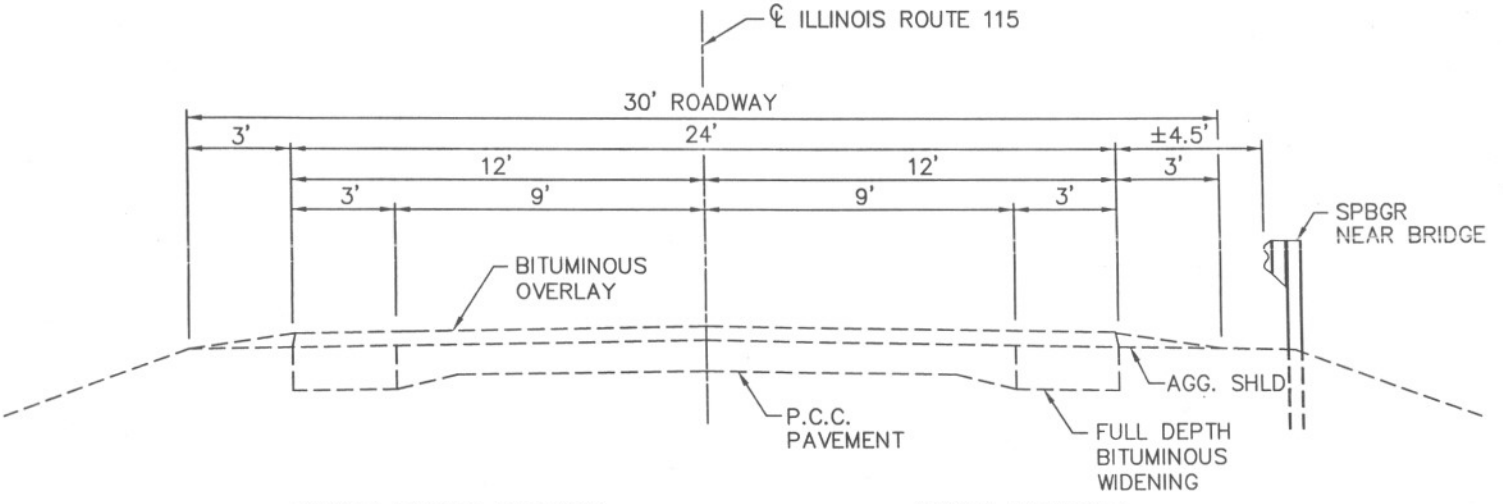
N

OATES ASSOCIATES	ILLINOIS ROUTE 115 OVER UNNAMED STREAM S.N. 027-0040	EXHIBIT A1



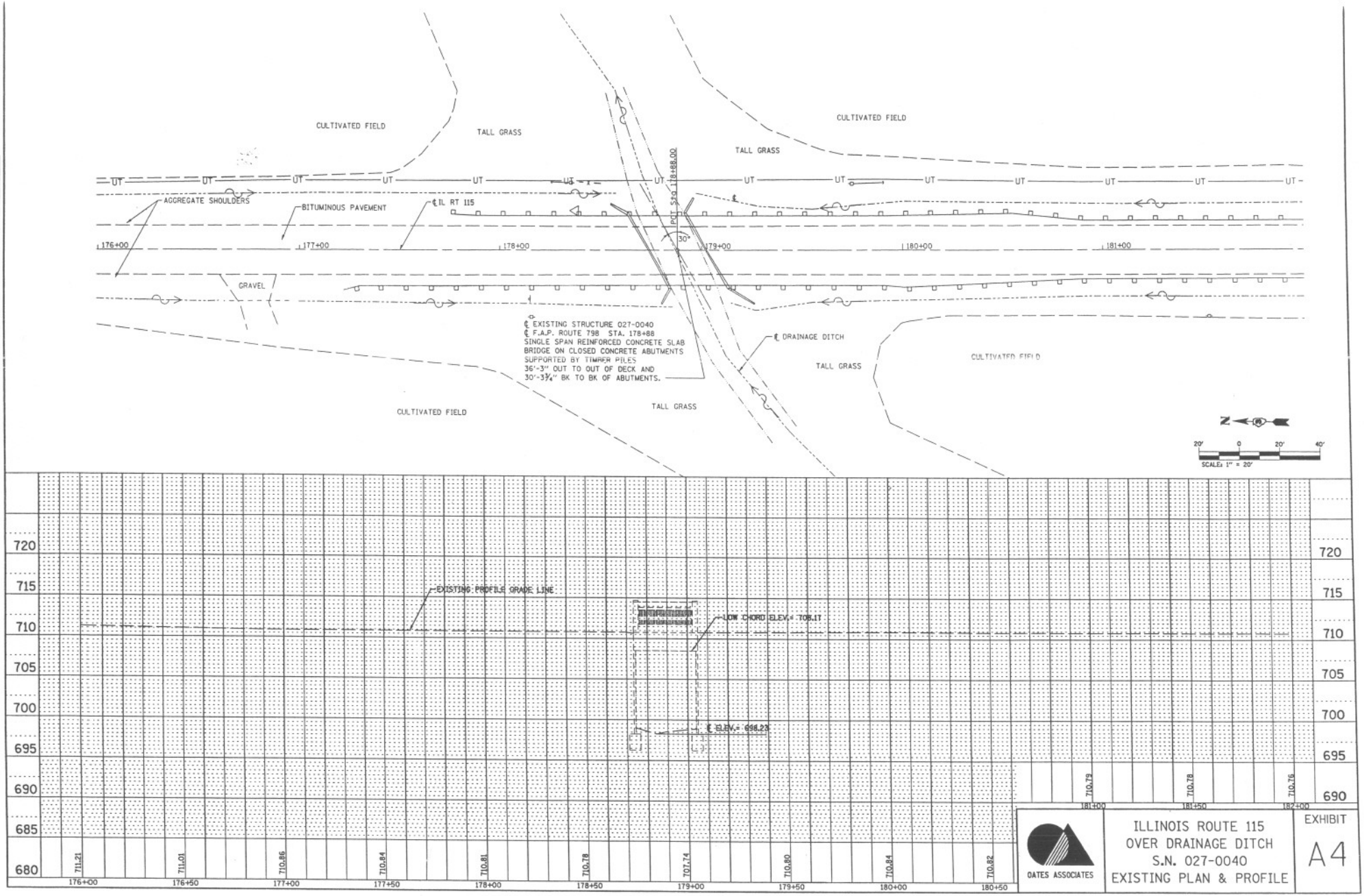
EXISTING BRIDGE CROSS SECTION

GATES ASSOCIATES	ILLINOIS ROUTE 115 OVER DRAINAGE DITCH S.N. 027-0040	EXHIBIT A2



APPROACH ROADWAY
TYPICAL SECTION

OATES ASSOCIATES	ILLINOIS ROUTE 115 OVER DRAINAGE DITCH S.N. 027-0040	EXHIBIT A3



OATES ASSOCIATES

ILLINOIS ROUTE 115
OVER DRAINAGE DITCH
S.N. 027-0040
EXISTING PLAN & PROFILE

EXHIBIT
A4

APPENDIX B

1928 BRIDGE AND ROADWAY PLANS

1998 OVERLOAD INVESTIGATION MEMORANDUM

BRIDGE INSPECTION REPORT

MMIS INVENTORY

3-23
027-0040

INDEX TO SHEETS

SUMMARY OF QUANTITIES

SECTION 107

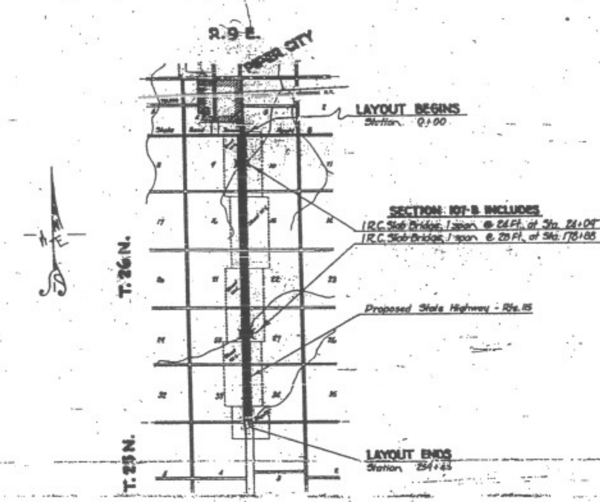
271858 - Cu. Yds. Class A Excavation
1952 - Cu. Yds. Borrow
2385 - Units Hedge Pulling
52002 - Sq. Yds. Pavement
100 - Each Erecting Right of Way Markers
46040 - Sq. Yds. Earth Shoulders
277.7 - Cu. Yds. Class X Concrete
26730 - Pounds Reinforcement Bars

SECTION 107-B

311.6 - Cu. Yds. Class X Concrete
34340 - Pounds Reinforcement Bars
2720 - Lin. Ft. Furnishing Unfr. Piles - 20 Ft. Long
2720 - Lin. Ft. Driving Piles - 20 Ft. Long

Route 115, Sections 107 & 107B, Ford Co.

From a point on State Bond Issue Route 8 near the N.W. corner of Section 10, T.26 N., R.9 E. of the 3rd P.M. --- to a point near the S.W. corner of Section 34, T.26 N., R.9 E. of the 3rd Princ. Meridian.



LAYOUT

Approximate Scale: 1 inch = 1 mile.
Net Length of Layout = 25445 Feet = 4.914 Miles.

SUMMARY OF CONCRETE

SECTION 107 — Class X

32	Standard Culvert Des. No. 828-1-3	60.8	Cu. Yds.
6	" " " " 828-1-5	13.2	" "
2	" " " " 828-1-6	5.6	" "
1	" " " " 1204-1-3	4.7	" "
2	" " " " 1204-1-5	11.2	" "
	Special Culvert Design Sta. 0+17	5.4	" "
	" " " " 8+00	6.0	" "
	" " " " 82+31	6.0	" "
	" " " " 104+00	6.0	" "
	" " " " 110+76	11.5	" "
	" " " " 123+38	15.5	" "
	" " " " 157+95	11.5	" "
	" " " " 161+88	10.2	" "
	" " " " 203+05	10.5	" "
	" " " " 210+80	6.0	" "
	" " " " 215+47	38.6	" "
	" " " " 223+14	11.5	" "
	" " " " 237+54	11.2	" "
	" " " " 245+31	12.4	" "
	" " " " 253+77	15.8	" "
	Total Concrete	277.7	Cu. Yds.

SECTION 107-B — Class X

Spec. Bridge Des. Sta. 24+09	129.2	Cu. Yds.
" " Sta. 178+88	182.4	" "
Totals	311.6	Cu. Yds.

SUMMARY

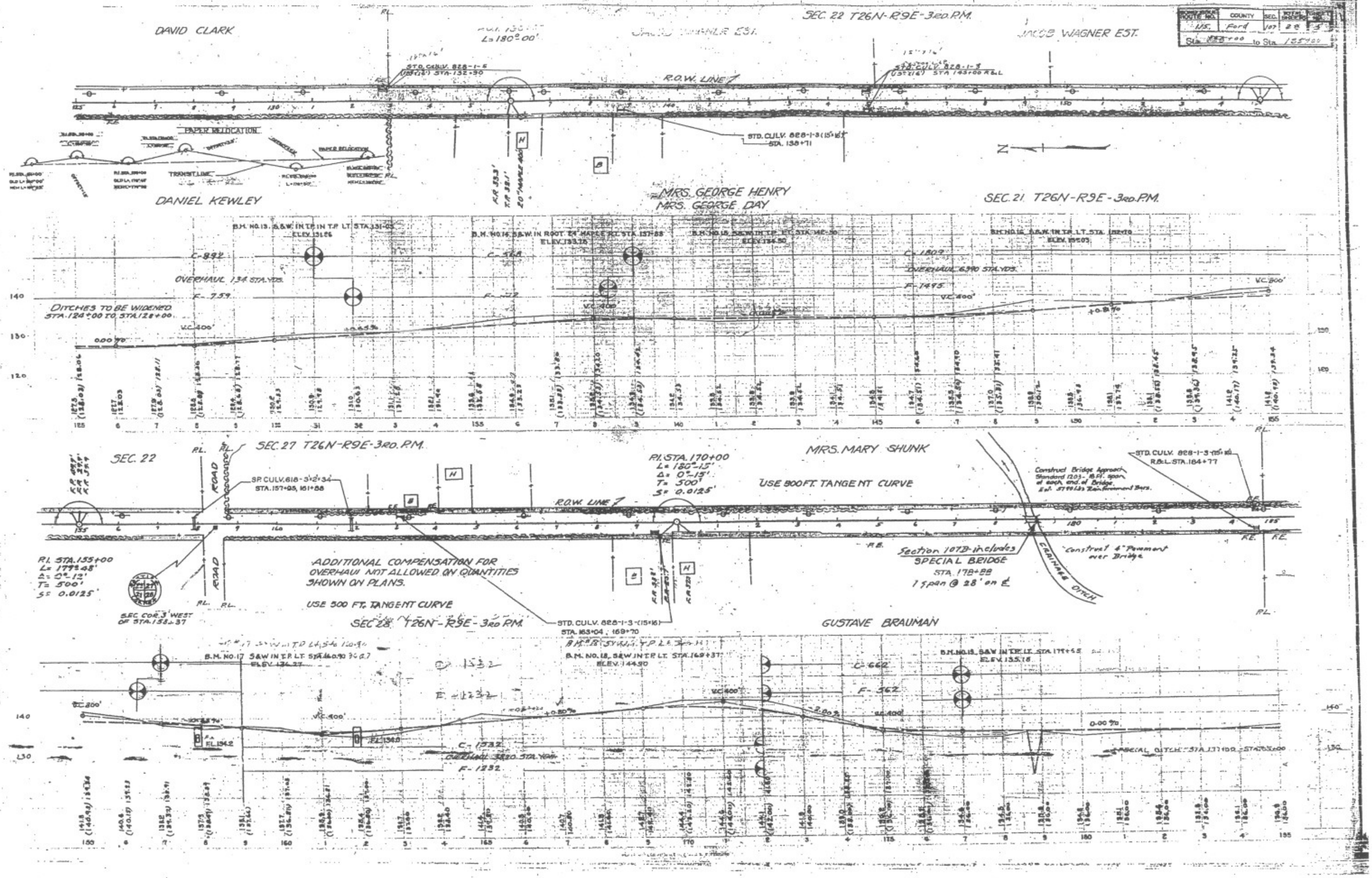
Station to Station	Width of Pavement	Gross Length Along Transit Line	Corrections for Curves		Corrections for Relocations				Net Length Along Final Center Line	Omissions			Net Length to be Improved in Feet			Pavement Over Bridges		Sq. Yds. of Pavement		
	Feet	Feet	Sta. of P.I.	Feet	Sta.	= Sta.	Feet +	Feet −	Feet	Sta.	to Sta.	Feet		18 Ft.	Total	Sta.	Feet	Widening	18 Ft.	Total
0+00 254+45	18	25445							25445					25445	25445	24+09 178+88	25.8 30.5	112.0	51890.0	52002
TOTALS		25445							25445					25445	25445		56.3	112.0	51890.0	52002

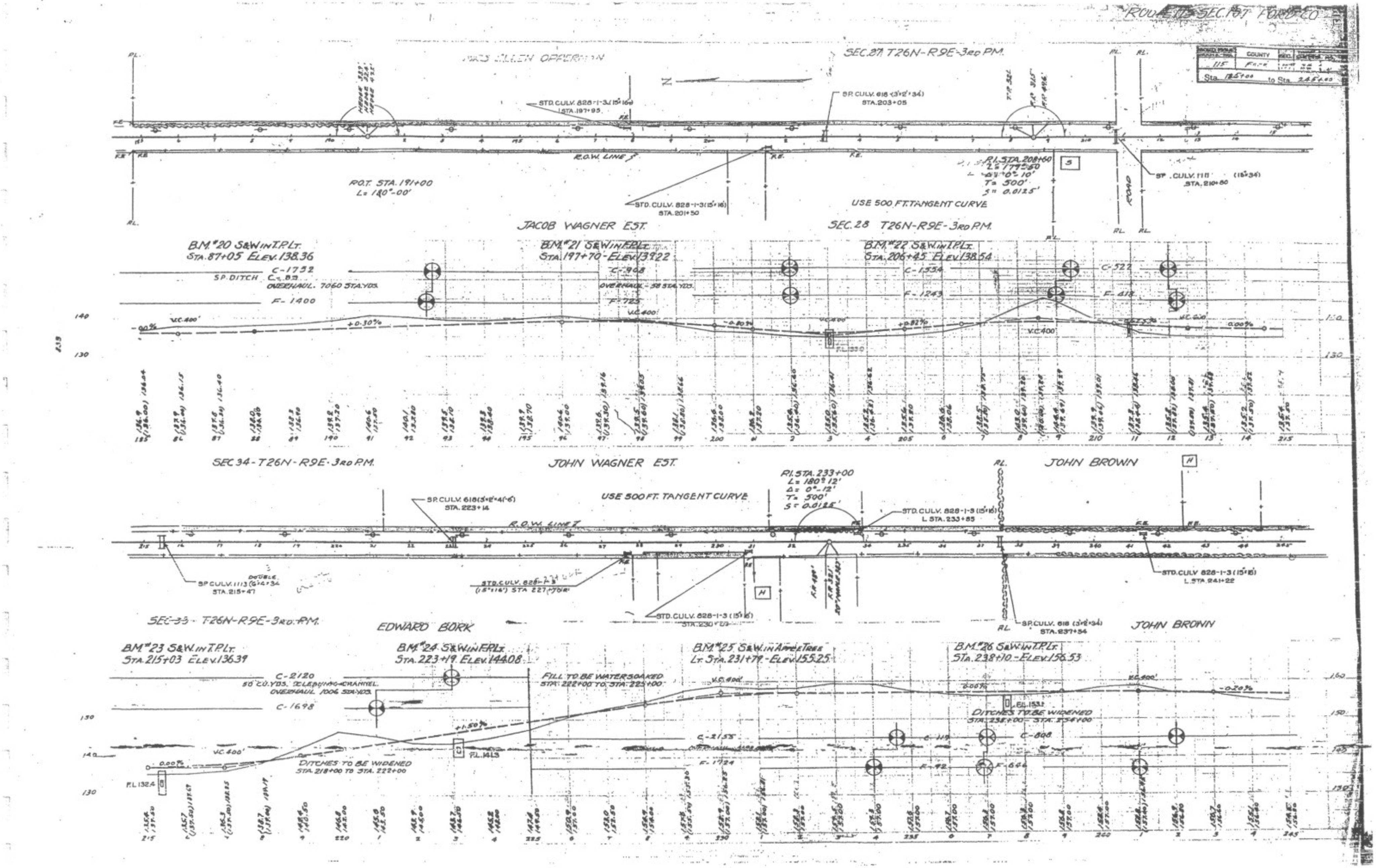
STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
DIVISION OF HIGHWAYS

Submitted November 1928
M. J. Fleming
Examined May 1930
[signature]
Passed May 17 1930
[signature]
Approved May 17, 1930
[signature]
Approved May 17, 1930
[signature]

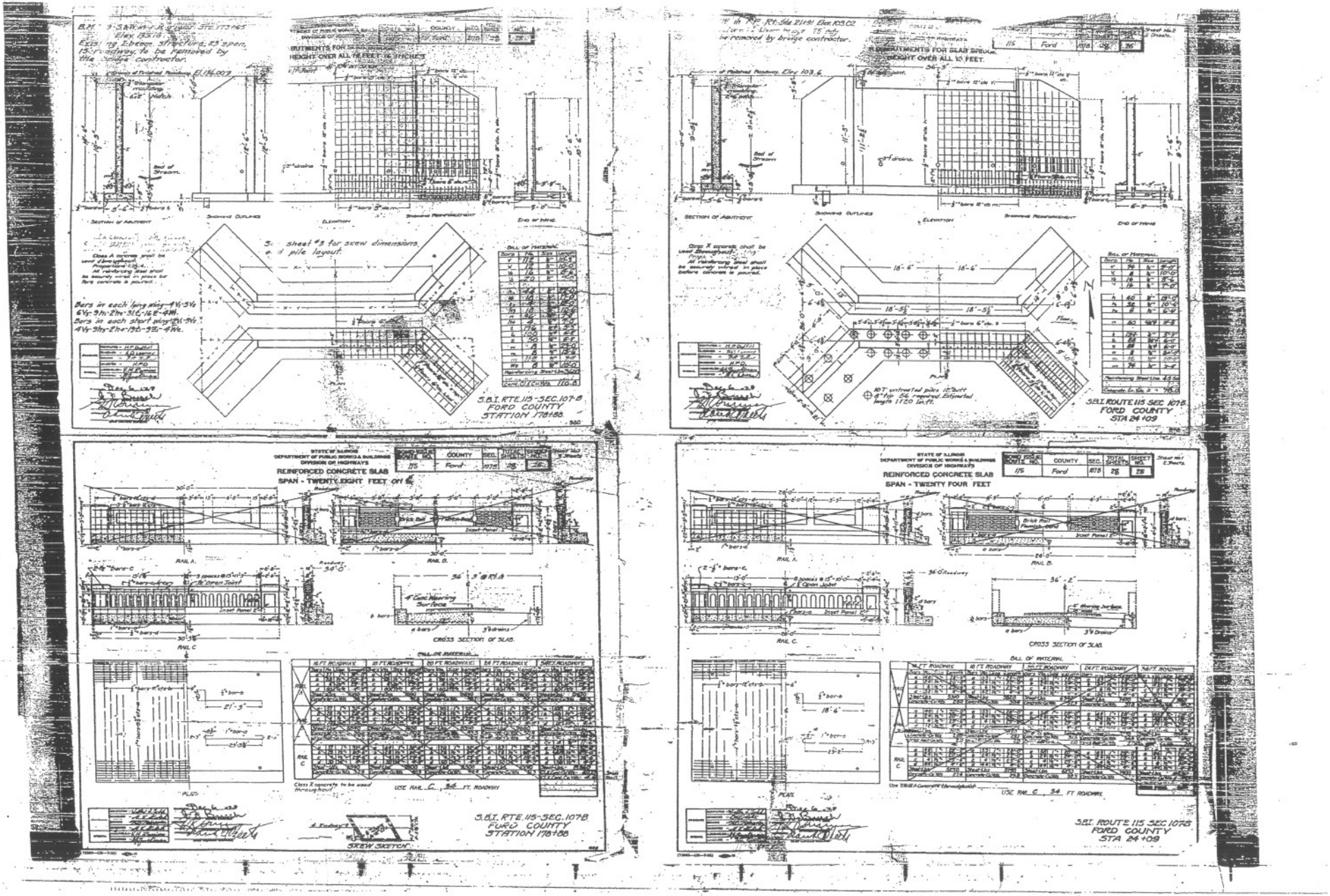
Made by: R.J.M. - 12-1-28
Rev. 3-7-30

ROUTE 115-SEC.107-FORD CO.





ROUTE 115 SEC. 107 FORD CO.
115
FORD
Sta. 185+00 to Sta. 245+00
SEC. 27 T26N-R9E-3RD P.M.
STD. CULV. 828-1-3 (15"x16") STA. 197+95
SP. CULV. 618 (3'x2'x34) STA. 203+05
R.O.W. LINE
P.O.T. STA. 191+00
L= 180°-00'
STD. CULV. 828-1-3 (15"x16") STA. 201+50
USE 500 FT. TANGENT CURVE
SP. CULV. 1111 (15"x34) STA. 210+60
ROAD
JACOB WAGNER EST.
SEC. 28 T26N-R9E-3RD P.M.
B.M. #20 S&W IN T.P. LT. STA. 87+05 ELEV. 138.36
B.M. #21 S&W IN F.P. LT. STA. 197+70 ELEV. 139.22
B.M. #22 S&W IN T.P. LT. STA. 206+45 ELEV. 138.54
SP. DITCH
OVERHAUL 7060 STA. YDS.
F-1400
C-1752
SEC. 34-T26N-R9E-3RD P.M.
JOHN WAGNER EST.
JOHN BROWN
P.I. STA. 233+00
USE 500 FT. TANGENT CURVE
SP. CULV. 618 (3'x2'x4'-6) STA. 223+14
STD. CULV. 828-1-3 (15"x16") L STA. 233+85
SP. CULV. 1113 DOUBLE STA. 215+47
STD. CULV. 828-1-3 (15"x16") STA. 230+67
SP. CULV. 618 (3'x2'x34) STA. 237+54
STD. CULV. 828-1-3 (15"x16") L STA. 241+22
SEC. 33 T26N-R9E-3RD P.M.
EDWARD BORK
JOHN BROWN
B.M. #23 S&W IN T.P. LT. STA. 215+03 ELEV. 136.39
B.M. #24 S&W IN F.P. LT. STA. 223+19 ELEV. 144.08
B.M. #25 S&W IN APPLE TREE LT. STA. 231+79 ELEV. 155.25
B.M. #26 S&W IN T.P. LT. STA. 238+10 ELEV. 156.53
FILL TO BE WATERSOAKED STA. 222+00 TO STA. 225+00
DITCHES TO BE WIDENED STA. 218+00 TO STA. 222+00
DITCHES TO BE WIDENED STA. 238+00 - STA. 234+00


REINFORCED CONCRETE SLAB
SPAN - TWENTY EIGHT FEET ON
SKEW SKETCH
3.B.I. RTE. 115-SEC. 107-B
FORD COUNTY
STATION 178+88
REINFORCED CONCRETE SLAB
SPAN - TWENTY FOUR FEET
3.B.I. ROUTE 115 SEC 107B
FORD COUNTY
STA 24+09

STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
DIVISION OF HIGHWAYS

PLANS FOR PROPOSED
STATE BOND ISSUE HIGHWAY

INDEX OF SHEETS

Sheet No.	Title
1	Cover Sheet
2	Typical Sections
3	Summary of Quantities
4	Standard 2298-1
5	Standard 2299-1
6	Standard 2300
7	Standard 2306-1
8	Standard 2171

SCALE IN FEET

PLAN 0 100 200 PROFILE VERT. 0 10 20

PROFILE HOR. 0 100 200 CROSS-SECTIONS 0 5 10

SBI ROUTE 115
SECTION (107,108) RS-2
FORD COUNTY

SEC.	COUNTY	TOTAL SHEETS	SHEET NO.
107 108 RS-2	FORD	8	1

M-93-995-00

LOCATION OF SECTION INDICATED THUS:—

1970 ADT 550-M

M-93-995-00

Overlay No. 17
Log Mile 9.20 to Log Mile 9.45

Overlay No. 16
Log Mile 8.71 to Log Mile 8.77

Overlay No. 15
Log Mile 8.45 to Log Mile 8.53

Overlay No. 14
Log Mile 8.05 to Log Mile 8.27

Overlay No. 13
Log Mile 7.00 to Log Mile 7.08

Overlay No. 12
Log Mile 5.74 to Log Mile 5.92

Overlay No. 11
Log Mile 5.60 to Log Mile 5.62

Overlay No. 10
Log Mile 4.86 to Log Mile 5.05

Overlay No. 9
Log Mile 4.70 to Log Mile 4.75

Overlay No. 8
Log Mile 4.45 to Log Mile 4.56

Overlay No. 7
Log Mile 4.29 to Log Mile 4.39

Overlay No. 6
Log Mile 3.99 to Log Mile 4.10

Overlay No. 5
Log Mile 3.74 to Log Mile 3.90

Overlay No. 4
Log Mile 2.86 to Log Mile 3.05

Overlay No. 3
Log Mile 2.45 to Log Mile 2.60

Overlay No. 2
Log Mile 2.23 to Log Mile 2.30

Overlay No. 1
Log Mile 1.24 to Log Mile 1.34

Overlay No. 18

RR Crossing
Log Mile 0.04

Intersection S. B. I. 115 & 115 54
Begin Log Mile 0.00

GROSS LENGTH OF IMPROVEMENT = 18.95 MILES

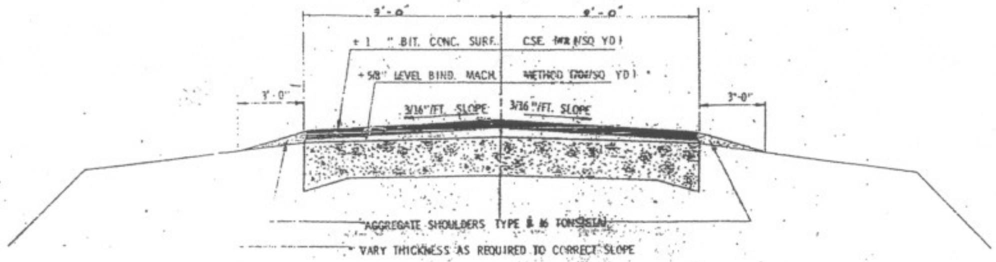
NET LENGTH OF IMPROVEMENT = 2.24 MILES

SCALE 1 INCH = 1 MILE

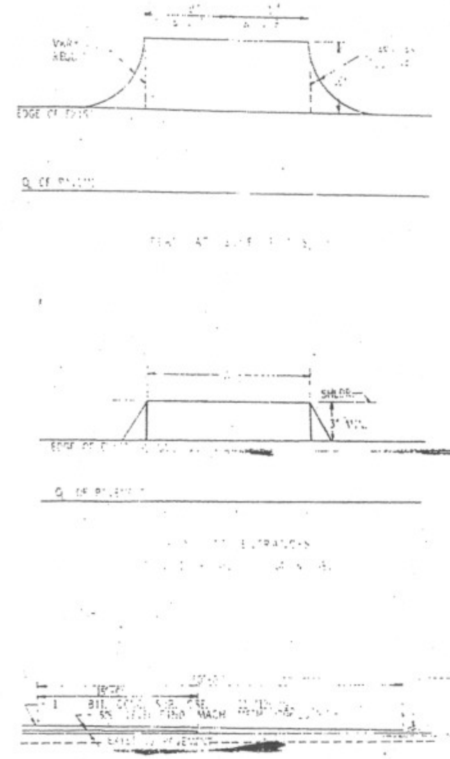
STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS AND BUILDINGS
DIVISION OF HIGHWAYS

CONTRACT NO. 26830

COUNTY SECTION S. B. I. ROUTE 115



TYPICAL SECTION OVERLAYS
NOT TO SCALE



State of Indiana
District Three

[redacted]

District Engineer of Design

Date : 4-15-70

Examined B.: Blaude Hershey
District Engineer of Construction

[redacted]

District Engineer of Maintenance
District Engineer of Materials
District Engineer of Traffic

[redacted]

Where section or ... section monuments are ... the engineer shall be notified before ... The contractor shall protect and carefully preserve all monuments ...

Illinois Department of Transportation

Memorandum

To:	Joseph S. Hill	Attn: Stan Paulis
From:	Ralph E. Anderson	By: Todd E. Ahrens
Subject:	OVERLOAD INVESTIGATION	
Date:	February 17, 1998	

IL Route 115 SN 027-0039 & 0040
Section 107-B
Ford County
Illinois Route 115 over Drainage Ditch

The Inventory and Rating Engineer for the Bureau of Bridges and Structures recommends the following loading restriction for this structure:

- ☐ Gross Weight _____ Pounds
- ☐ Single Vehicle _____ Pounds
- ☐ Combination Vehicle, 3 or 4 Axles _____ Pounds
- ☐ Combination Vehicle, 5 or More Axles _____ Pounds
- ☒ Legal Loads Only. This information will be entered in Roadway Referencing System.
- ☐ Other, Specify

This action has been determined for the following reason:

- ☐ Updated analysis of the structure for load-carry capacity.
- ☐ Impact or other damage sustained by bridge.
- ☒ Deficiencies in condition of structural members.
- ☐ Other, Specify.

This restriction is to be observed for the following period: until the structure is rehabilitated or replaced.

DISTRICT 3
BUREAU OF OPERATIONS
FEB 19 '98

	INIT	ACT
OPERATIONS ENGR		
SERV & DEVEL ENGR		
FIELD ENGRS		
BRIDGE MAINT ENGR		
TRAFFIC ENGR		
DESIGN & PLAN ENGR		
PERMITS		
SECRETARY		
FORMULATE		

CPP/RJC/bb14198
cc- James J. Jereb/Attn: Chris McCarter

Todd E Ahrens

SUFFICIENCY RATING | 44.5 | | 66.8 | | | '02

Illinois Department of Transportation

Bridge Inspection Report

Sheet 1 of 4

Mo.	Day	Yr.	Temp.	Inspector
3	7	01	35°	BRAY, KEENER
1	7	02	31	FANCHER, HENRICHS
9	25	02	70	McCARTER

027 - 0040

ILL 115 ; 3.38 M S OF US 24
over DRAIN DITCH
Spans = 1 Built 1929

Year | 01 | 02 | 02 | | |

Remarks

108A Wearing Surface Type: G
108B Type of Membrane: F
108C Deck Protection: J
108D Total Deck Thickness: 23"

Deck	Element Rating				
Wearing Surface	4	3	3		
Deck Structural Condition	2	2	2		
Curbs	2	2	–		
Median			–		
Sidewalks			–		
Parapet			–		
Railing	2	2	2		
Drains	3	3	3		
Light Standards			–		
Expansion Joints			–		

~~OVERLAY~~ '99

CONC. ROTTEN AT BOTTOM

MEAS Opening

58 Condition Rating	5	5	4		

'02 EXPOSED REBAR AT WATERTABLES & AT DRAINS - +/- 1/2 OF DECK SOFFIT HAS CRACKING & LEACHING W/ STALACTITES

Bridge Railing Appraisal

	'01				'02				'02									
36 Condition Rating	3	3	3	2	3	3	3	2	3	3	3	2						

NO ET 2000

TY 72

Superstructure					
Bearing Devices			–		
Stringers			–		
Girders or Beams			–		
Diaphragms or Braces			–		
Crack Leaching	2	2	2		
Joints (Leakage or Cond.)	2	2	2		
59C Util.			N		
Trusses			–		
Portals and Bracing			–		
Drainage System	2	2	–		
Paint			–		
Color: Facia ____ Inter ____ Rail ____					
Rivets or Bolts			–		
Weld Cracking			–		
Rust			–		
Timber (Decay, Damage)			–		
Concrete Cracking	2	2	2		
Collision Damage	4	4	–		
LL Deflec & Vibration	4	4	4		
Alignment of Members			–		

CONC. ROTTEN AROUND DRAIN W/ EXPOSED REBAR

59A MO/YR: | | 59B Code: 1 | | 2 | | 3 | | H | |

Worst % Loss | | %

ALONG SOFFIT W/ EXPOSED REBAR

59 Condition Rating	5	5	4		

'02 SAME AS DECK

BM-BIR-1 (Rev. 1/90)

Bridge Inspection Report

Bridge No. 027-0040

Year 01 01 02

Waterway Adequacy

71 Appraisal Rating 7 8 8

Approach Roadway Alignment

72 Appraisal Rating 8 8 8

72 A Condition Rating	7 6 4
Riding Quality	4 2 2
Settlement	3 2 2
Structural Condition	3 3 3
Relief Joints	–

RAMPED S - ROUGH

Posting Year

70A2 Inspectors Rating

70B2 Inspectors Rating

70C2 Inspectors Rating

70D2 Inspectors Rating

70A2 = Single Unit Vehicle
70B2 = Combination Type 3S- 1, 3 or 4 axles
70C2 = Combination Type 3S- 2, 5 or more axles
70D2 = One Truck at a Time

Proposed Maintenance Repair

Repair Code	Repair Description	Asgd to Code	Priority Code	Quantity	Unit Cost	Date Cmpl

AGENCY CODES:
TS - DISTRICT TEAM SECTION
BC - DISTRICT BRIDGE CREW
DL - DAY LABOR
MC - MAINTENANCE CONTRACT
RC - REPAIR FOR REHAB CONTRACT

PRIORITY CODES:
1 - DO THIS YEAR
2 - SHOULD DO THIS YEAR
3 - WHEN CONVENIENT

Year 01 02

Bridge Inspection Report

Bridge No. 027-0040

Additional Remarks

'01 - DECK SOFFIT & AROUND DRAINS ROTTEN W/ EXPOSED REBAR
WINGWALLS CRACKED / ROTTEN AT CORNERS
ABUT. BACKWALL CRACKED W/ HEAVY LEACHING.

'02 NO CHANGE (S. APPR - ASPHALT "RAMP" - ROUGH)

'02 DECK & SURF LOWERED TO 4. EXPOSED REBAR AT EAST & WEST WATER TABLES AND AT DECK DRAINS. ± 1/2 OF DECK SOFFIT IS CRACKING & LEACHING WITH STALACTITES. SPALL W/ EXPOSED REBAR AT W. END OF S. ABUT. CRACKING & LEACHING AT BOTH ABUTMENTS. BEAMS CAN JUST BE SEEN AT THE

Bridge Inspection Report

Year 01 02

Bridge No. _____ - _____

Substructure	Element Rating	Remarks
Abutments-Wing	3 3 3	CRACKS - ROTTEN AT CORNERS
Backwall	2 2 –	CRACKS W/ LEACHING
Bearing Seat	2	
Stem	2	
Slopes	–	
Erosion	3 3 3	
Settlement	4 4 –	
Piers or Bents	–	
Cap	–	
Column	–	
Crash Walls	–	
Scour	–	
Settlement	–	
Fender Systems	–	
Steel Corrosion	–	
Timber Decay, etc.	–	
Debris on Seat	–	
Paint	–	
Collision Damage	–	
60 Condition Rating	5 5 5	

Channel & Channel Protection

Scour of Channel	2+ 2+ 2	
Erosion of Banks	2 2 2	
Drift	2+ 2+ 2	
Vegetation	2 2 2	
Change in Channel	2 2 2	
Spur Dykes & Jetties	–	
Rip Rap or Slope Wall	–	
61 Condition Rating	5 5 5	'02 OLAVER DAM JUST EAST OF STR.

Pier & Abutment Protection

111 Condition Rating N N N

Culverts

Wing Walls		
Head Walls		
Top Slab		
Walls		
Floor		
Siltation		
Settlement		
Scour		
62 Condition Rating	N N N	

ILLINOIS DEPARTMENT OF TRANSPORTATION
ILLINOIS STRUCTURE INFORMATION SYSTEM
MASTER REPORT
INVENTORY DATA

STRUCTURE NUMBER: 027 - 0040 DIST: 3

FACILITY CARRIED: ILL 115
FEATURE CROSSED: DRAIN DITCH
BRIDGE REMARKS:
BRIDGE STATUS: OPEN - NO RESTRICT
STATUS REMARKS:
MAINT COUNTY: FORD MAINT TOWNSHIP: BRENTON
MAINT RESPONSIBILITY: I.D.O.T.
SERVICE ON/UNDER: HIGHWAY / WATERWAY

REPORTING AGENCY: I.D.O.T. - BUREAU OF MAINTENANCE
MAIN SPAN MAT"L/TYPE: CONCRETE / SLAB
NUMBER OF SPANS: (MAIN SPANS) - 01 (APPROACH SPANS) - 00
*** APPROACHES ***
NEAR #1 MAT"L/TYPE: /
NEAR #2 MAT"L/TYPE: /
FAR #1 MAT"L/TYPE: /
FAR #2 MAT"L/TYPE: /
MEDIAN WIDTH/TYPE: 00 FT. NONE
GUARDRAILS L/R: STEEL PLATE BEAM STEEL PLATE BEAM
TOLL FACILITY: NO TOLL
LATITUDE: 40 D 41 M 58.69 S LONGITUDE: 88 D 10 M 50.64 S

BRIDGE NAME:
LOCATION: 3.38 M S OF US 24
BRIDGE STATUS DATE: 04 / 1988

SUFFICIENCY RATING: 066.8
HBRRP ELIGIBLE: YES
REPLACED BY: 000 - 0000
REPLACES: 000 - 0000
LAST UPDATE DATE: 09/27/2002
PARALLEL STRUCTURE: NONE
MULTI-LEVEL STRUC NUMBER:
SKEW DIR: RIGHT
SKEW ANGLE: 25 00 00
STRUCTURE FLARED: NO
HISTORICAL SIGNIFICANCE: NO
BORDER BRIDGE STATE:
BDR STATE SN:
BDR STATE % RESPONSIBILITY: 00
STRUCTURAL STEEL WT: 000000000

RATED BY: IDOT RATING METHOD: ALLOWABLE STRESS
INVENTORY RATING: HS 17.0 (231) RATING DATE: 05/11/2000
OPERATING RATING: HS 33.2 (260)
DESIGN LOAD: 12-T ROLLER

STRUCTURE LENGTH:	30.5	SIDEWALKS UNDER STRUCTURE: NONE				
AASHTO BRIDGE LENGTH:	52.3	SIDEWALK WIDTH RIGHT:	0.0	CULVERT FILL DEPTH:	0.0	*** RAILROAD CROSSING INFO ***
LENGTH OF LONG SPAN:	29.5	SIDEWALK WIDTH LEFT:	0.0	CULVERT CELLS(COUNT):	0	CROSSING 1 NBR:
BRIDGE ROADWAY WIDTH:	32.8	NAVIGATION CONTROL:	NO	CULVERT OPENING AREA:	0.0	CROSSING 2 NBR:
APPR ROADWAY WIDTH:	30.0	NAVIGATION HORZ CLEAR:	0000	CULVERT CELL HEIGHT:	0.00	RR LATERAL UNDERCLEAR: 0.0
DECK WIDTH:	36.4	NAVIGATION VERT CLEAR:	000	CULVERT CELL WIDTH:	0.00	RR VERT UNDERCLEAR: 00 FT 00 IN

DECK STRUCTURE TYPE: CIP CON NRMLLY FORM DECK STRUCTURE THICKNESS: 17.5

*** KEY ROUTE ON DATA ***

KEY ROUTE NBR: FEDERAL-AID PRIMARY 0798 STATION: 3.38
APPURTENANCES: MAIN ROUTE 0.000 SEGMENT:
INVENTORY COUNTY: FORD LINKED: YES
TOWNSHIP/ROAD DIST: BRENTON
MUNICIPALITY:
URBAN AREA:
FUNCTIONAL CLASS: MINOR ARTERIAL (RURAL)
NATIONAL HWY SYSTEM: NOT ON
INVENTORY DIRECTION: SOUTH
ADT YR/COUNT: 2001 / 000600
TRUCK PERCENTAGE: 13
NUMBER OF LANES: 02
ONE OR TWO WAY: TWO-WAY
BYPASS LENGTH: 02
FUTURE ADT YR/COUNT: 2023 / 900
DESIGNATED TRUCK ROUTE: CLASS 2
SPECIAL SYSTEMS: NO

** CLEARANCES **	SOUTH/EAST	NORTH/WEST
MAX. RDWY WIDTH:	32.8 FT	
HORIZONTAL:	32.8 FT	0.0 FT
MIN VERTICAL:	99 FT 11 IN	00 FT 00 IN
10 FT VERTICAL:	99 FT 11 IN	00 FT 00 IN
LATERAL:		

*** KEY ROUTE UNDER DATA ***

0000 STATION: 0.00
0.000 SEGMENT:
LINKED:
NATIONAL HWY SYSTEM:
INVENTORY DIRECTION:
ADT YR/COUNT: 0000 / 000000
TRUCK PERCENTAGE: 0
NUMBER OF LANES: 00
ONE OR TWO WAY:
BYPASS LENGTH: 00
FUTURE ADT YR/COUNT: 0000 / 000
DESIGNATED TRUCK ROUTE:
SPECIAL SYSTEMS: NO

SOUTH/EAST	NORTH/WEST
0.0 FT	
0.0 FT	0.0 FT
00 FT 00 IN	00 FT 00 IN
00 FT 00 IN	00 FT 00 IN
0.0 FT	0.0 FT

*** MARKED ROUTE ON DATA ***

	DESIGNATION	KIND	NUMBER
ROUTE #1	MAINLINE	STATE HIGHWAY	0115
ROUTE #2			
ROUTE #3			

*** MARKED ROUTE UNDER DATA ***

DESIGNATION KIND NUMBER

STRUCTURE NUMBER: 027 - 0040 DIST: 3 INSPECTION/IMPROVEMENT DATA

*** DATA RELATED TO INSPECTION INFORMATION ***

*** INSPECTION INTERVALS ***
ROUTINE NBIS: 12 MOS UNDERWATER: 00 MOS
FRACTURE CRITICAL: 00 MOS SPECIAL: 00 MOS

*** MAXIMUM ALLOWABLE POSTING LIMITS ***
ONE TRUCK AT A TIME: COMBINATION TYPE 3S-1: TONS
SINGLE UNIT VEHICLES: TONS COMBINATION TYPE 3S-2: TONS
BRIDGE POSTING LEVEL: LEGAL LOAD ONLY

*** INSPECTION/APPRAISAL INFORMATION ***

INSPECTION DATE 09/25/2002 SPECIAL INSPECTION DATE: 00/00/0000
INSPECTION TEMPERATURE: +70 DEG. F.

DECK: 4 POOR CONDITION - ADVANCED DETERIORATION
BRIDGE RAILING APPRAISAL: 3 MEETS STANDARDS
APPROACH GUARDRAIL: 3 3 2 ACCEPTABLE ACCEPTABLE NOT ACCEPTABLE
SUPERSTRUCTURE: 4 POOR CONDITION - ADVANCED DETERIORATION
SUBSTRUCTURE: 5 FAIR CONDITION - MINOR SECTION LOSS, CRACKS
CHANNEL AND PROTECTION: 5 FAIR CONDITION - MINOR SECTION LOSS, CRACKS
CULVERT: N NOT APPLICABLE
STRUCTURAL EVALUATION: 4 MINIMUM ADEQUACY TO BE LEFT IN PLACE
DECK GEOMETRY: 6 EQUAL TO PRESENT MINIMUM CRITERIA
UNDERCLEARANCE-VERT,LAT: N NOT APPLICABLE
WATERWAY ADEQUACY: 8 EQUAL TO PRESENT DESIRABLE CRITERIA
APPROACH RDWY ALIGN: 8 EQUAL TO PRESENT DESIRABLE CRITERIA
PIER NAVIG PROTECTION: N N/A
INSPECTED BY (NAME): McCarter
INSPECTION REMARKS: '02 Deck and super lowered to 4. Exposed rebar at east and west watertables and at deck drains. +- 1/2 of deck soffit is cracking and leaching w/ stalagtites. Spall w/ exp rebar @ W. end of S. abut. Beaver dam just E. of str.

*** ACTUAL POSTED LIMITS ***
SINGLE UNIT VEHICLES: TONS
COMBINATION TYPE 3S-1: TONS
COMBINATION TYPE 3S-2: TONS
POSTED ONE TRUCK AT A TIME:

UTILITIES ATTACHED:

DECK WEARING SURFACE: BITUMINOUS OVERLAY
DECK MEMBRANE: NONE
DECK PROTECTION: NONE
TOTAL DECK THICKNESS: 23.0 IN

LAST PAINT DATE 00/0000 LAST PAINT TYPE

*** UNDERWATER INSPECTION/APPRAISAL INFORMATION ***

INSPECTION DATE: 00/00/0000 INSPECTION CATEGORY:
TEMPERATURE: +0 F. INSPECTION METHOD:
INSPECTED BY: APPRAISAL RATING:
INSPECTION REMARKS:

*** SCOUR CRITICAL INFORMATION ***

APPRAISAL RATING: 5 STABLE FOR SCOUR EVALUATION METHOD: COMPUTER CALCULATION
ANALYSIS DATE: 03/28/1995 ANALYSIS BY (NAME): MCCARTER

*****MISCELLANEOUS*****

FRAC CRIT: NO INSP. DATE: / / APPR:
MICROFILM: YES

*** CONSTRUCTION INFORMATION ***

YEAR: 1929 ORIGINAL 0000 RECONSTRUCTED
ROUTE: SBI-115 STA: 178+88 STA:
SECTION NBR: 107-B
CONTRACT NBR:
FED AID PR #: 00000000000000
BUILT BY: I.D.O.T.

*** WATERWAY INFORMATION ***

FLOOD DESIGN FREQUENCY: 000 YRS DRAINAGE AREA: 00000000.0 ACRE
FLOOD DESIGN Q (CFS): 0000000
FLOOD DESIGN NAT H W E: 0.00 FLOOD BASE Q (C F S): 0000000
FLOOD DES OPEN PROP: 0000000 SF FLOOD BASE NAT H W E: 0.00

*** PROPOSED IMPROVEMENTS ***

COST ESTIMATE YEAR: 0000 LENGTH: 000000
TYPE OF WORK:

DONE BY:
REMARKS:

*** COSTS IN DOLLARS ***
BRIDGE IMPROVEMENT COST: $ 0
ROADWAY IMPROVEMENT COST: $ 0

TOTAL PROJECT COST: $ 0

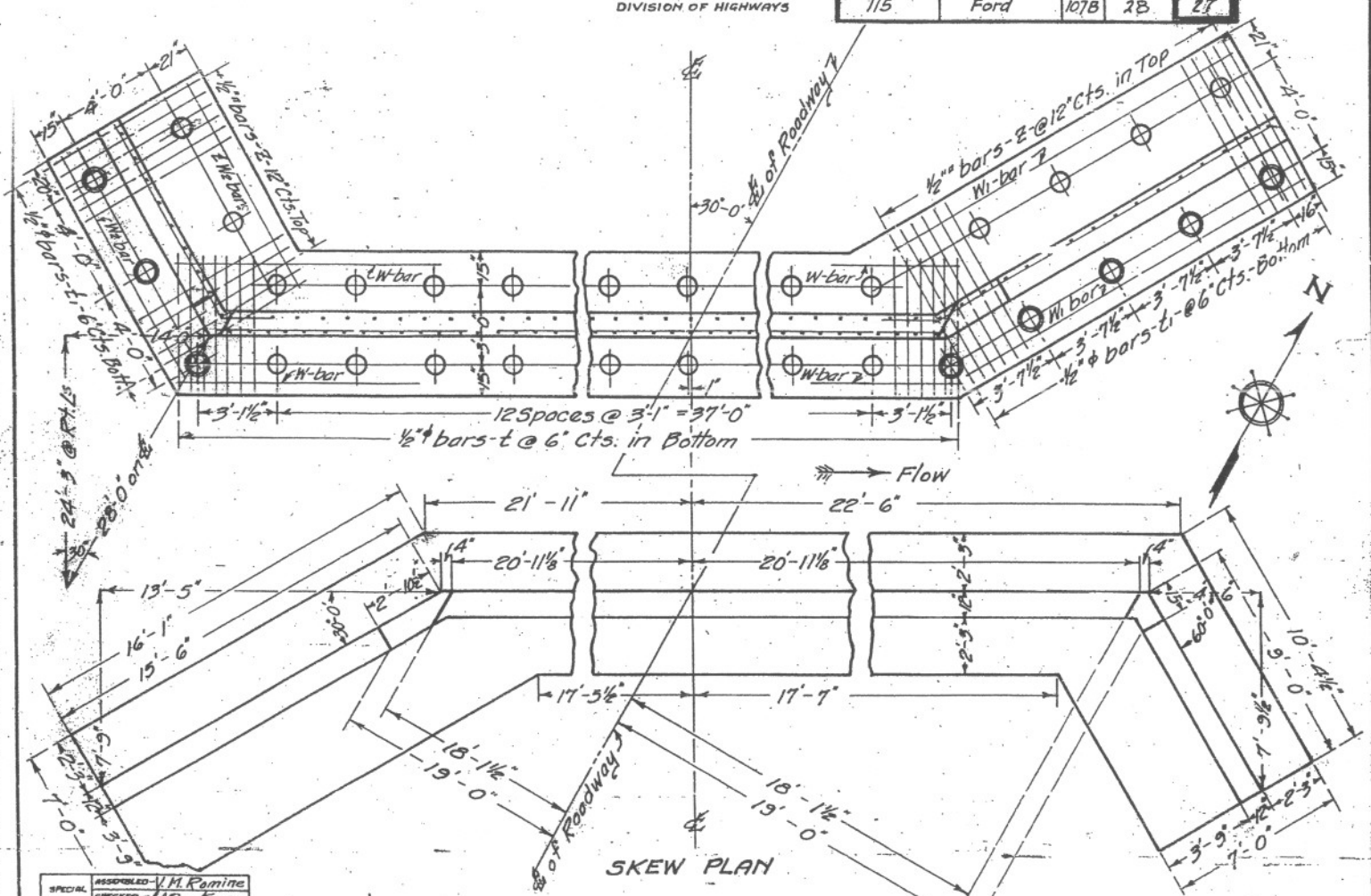
APPENDIX C

FIELD INSPECTION SKETCHES

STATE OF ILLINOIS
DEPARTMENT OF PUBLIC WORKS & BUILDI
DIVISION OF HIGHWAYS

BOND ISSUE ROUTE NO.	COUNTY	SEC.	TOTAL SHEETS	SHEET NO.
115	Ford	107B	28	27

Sheet No. 3 of 3 Sheets



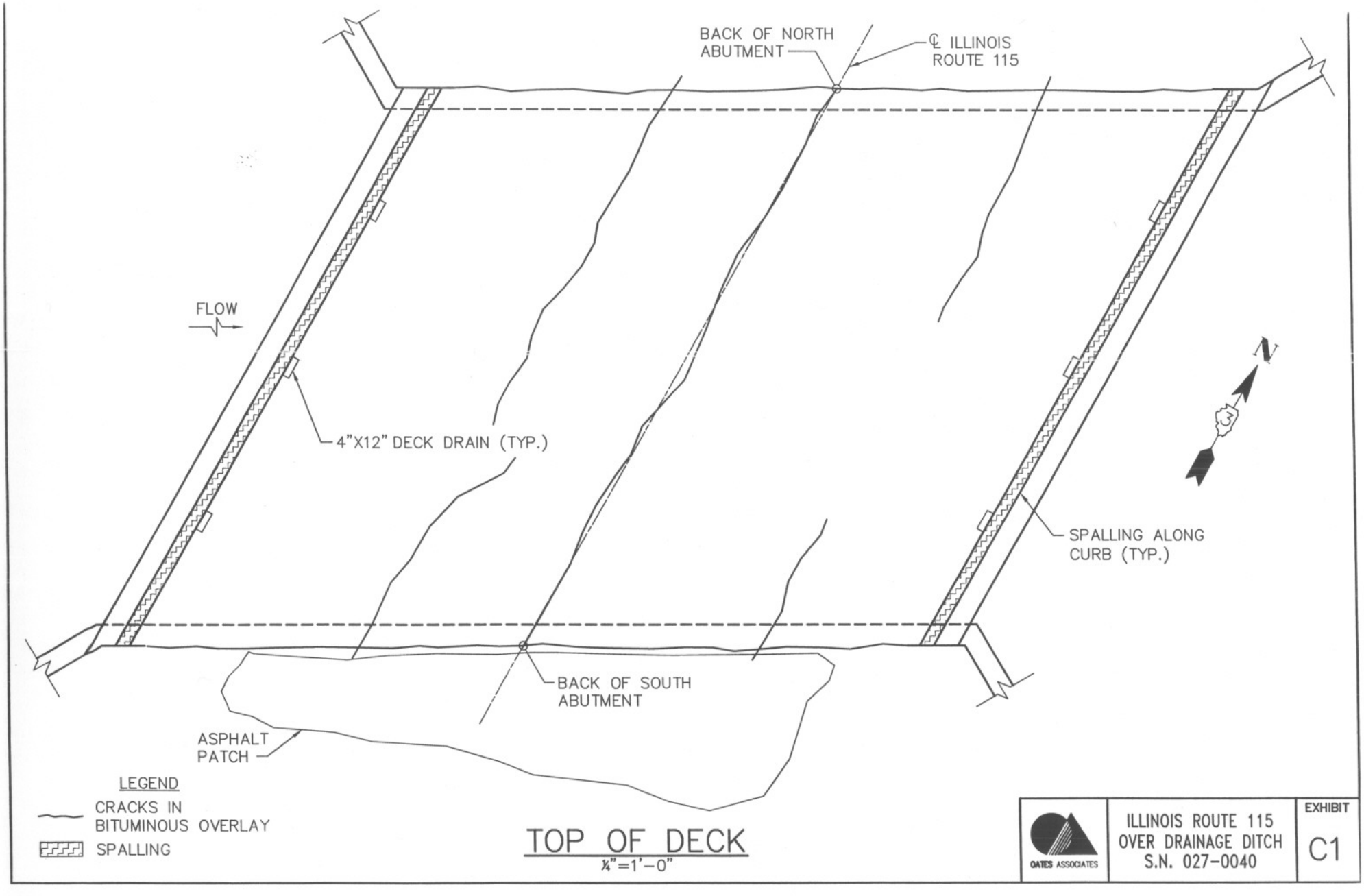
SPECIAL | ASSEMBLED - V. M. Romine | CHECKED - H. J. Jackman

Engineer's Estimate
10 Ton Untr. Piling.
12" Butt, 8" Tip, 64 Req'd.
Est. Length 1280 Lin. Ft.
12" Top Untr. Piling
12" Butt, 8" Tip, 16 Req'd.
Est. Length 320 Lin. Ft.

1280

S.B.I. RTE. 115 SEC. 107B
FORD COUNTY
STATION 178+88

27-0090



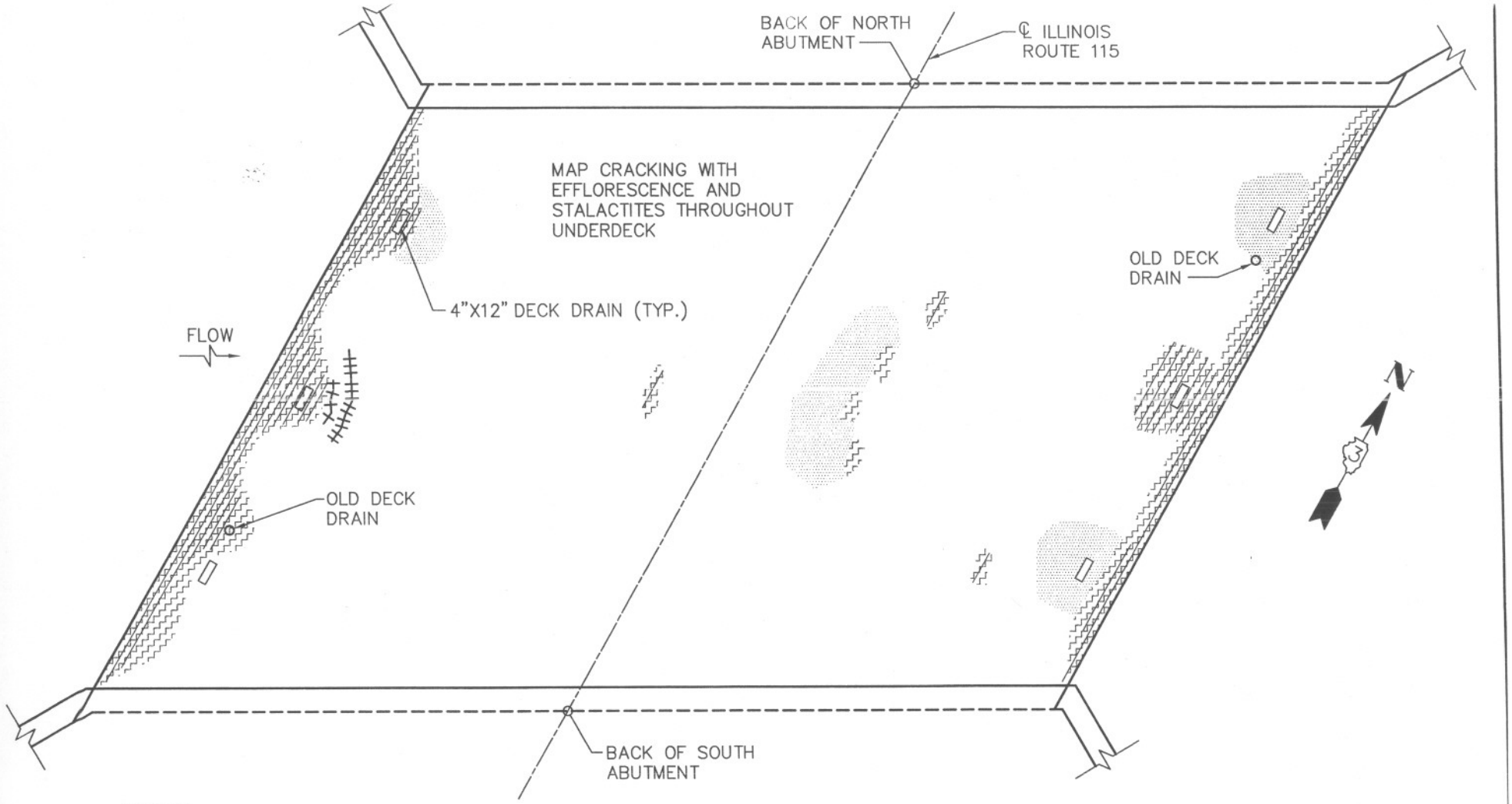
TOP OF DECK

¼"=1'-0"

OATES ASSOCIATES

ILLINOIS ROUTE 115
OVER DRAINAGE DITCH
S.N. 027-0040

EXHIBIT
C1



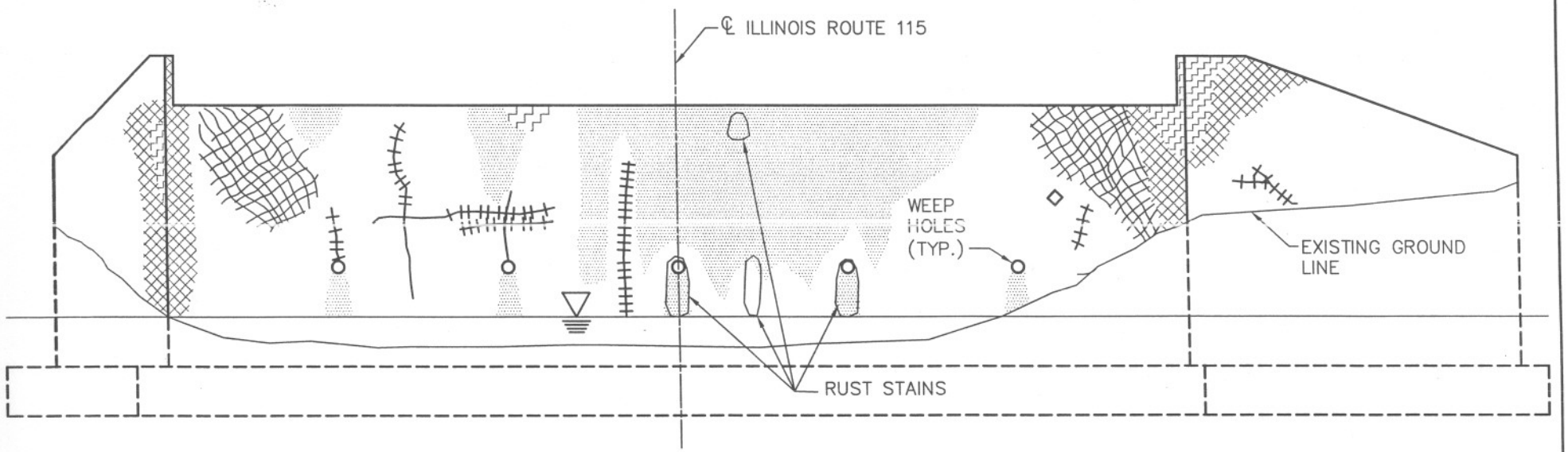
BOTTOM OF DECK

1/4"=1'-0"

OATES ASSOCIATES

ILLINOIS ROUTE 115
OVER DRAINAGE DITCH
S.N. 027-0040

EXHIBIT
C2



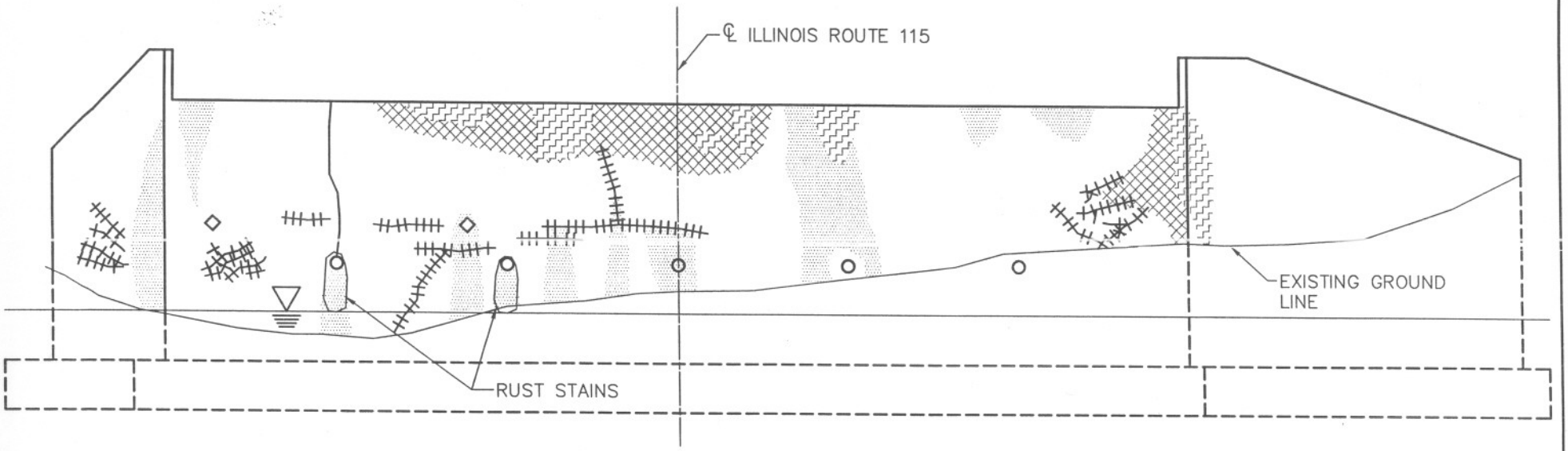
NORTH ABUTMENT AND WINGWALL ELEVATIONS

¼"=1'-0"

LEGEND

- CRACKING
- CRACKING W/ EFFLORESCENCE
- MOISTURE AND EFFLORESCENCE STAINING
- SPALLING
- HOLLOW AREAS

OATES ASSOCIATES	ILLINOIS ROUTE 115 OVER DRAINAGE DITCH S.N. 027-0040	EXHIBIT C3



SOUTH ABUTMENT AND WINGWALL ELEVATIONS

¼"=1'-0"

LEGEND

- CRACKING
- CRACKING W/ EFFLORESCENCE
- MOISTURE AND EFFLORESCENCE STAINING
- SPALLING
- HOLLOW AREAS

OATES ASSOCIATES	ILLINOIS ROUTE 115 OVER DRAINAGE DITCH S.N. 027-0040	EXHIBIT C4

APPENDIX D

PHOTOGRAPHS

STRUCTURE NUMBER STAMP

UPSTREAM (taken from structure)

EXHIBIT D1

DOWNSTREAM (taken from structure)

LOOKING SOUTH FROM SOUTH ABUTMENT

EXHIBIT D2

LOOKING SOUTH, 30' NORTH OF NORTH ABUTMENT

LOOKING NORTH FROM NORTH ABUTMENT

EXHIBIT D3

LOOKING NORTH, 30' SOUTH OF SOUTH ABUTMENT

BRIDGE ELEVATION – UPSTREAM SIDE

EXHIBIT D4

BRIDGE ELEVATION – DOWNSTREAM SIDE

N.W. QUAD DITCH

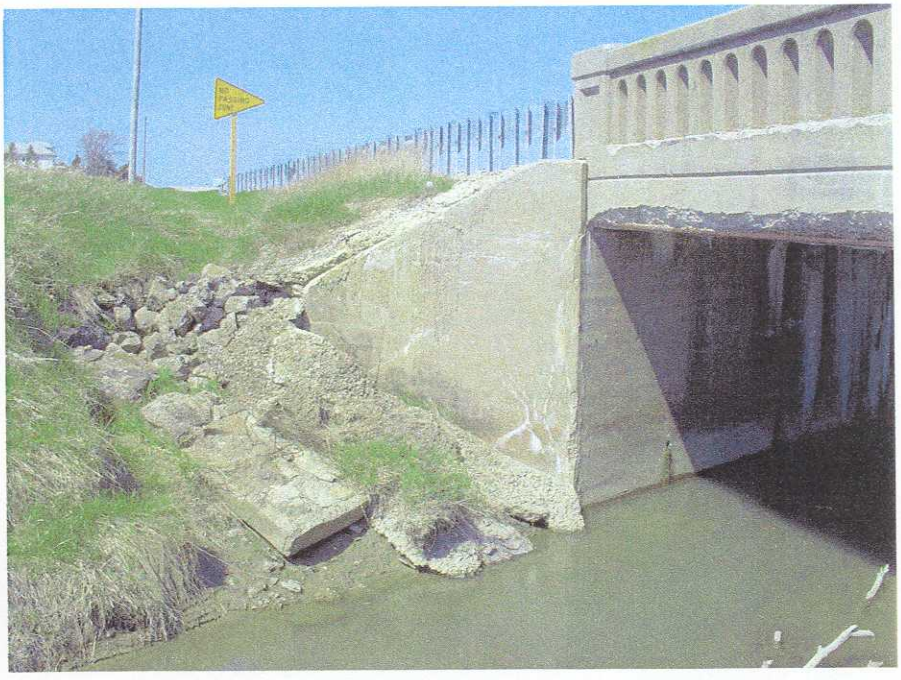
EXHIBIT D5

N.E. QUAD DITCH

S.E. QUAD DITCH

EXHIBIT D6

S.W. QUAD DITCH



N.W. CORNER OF STRUCTURE (taken from flowline)

EXHIBIT D7

N.E. CORNER OF STRUCTURE (taken from flowline)

S.E. CORNER OF STRUCTURE (taken from flowline)

EXHIBIT D8

S.W. CORNER OF STRUCTURE (taken from flowline)

NORTH EXPANSION JOINT (looking west)

EXHIBIT D9

NORTH EXPANSION JOINT (looking east)

SOUTH EXPANSION JOINT (looking west)

EXHIBIT D10

SOUTH EXPANSION JOINT (looking east)

DECK SURFACE (overall) LOOKING SOUTHWEST

EXHIBIT D11

DECK SURFACE (overall) LOOKING NORTHEAST

SOUTH APPROACH PAVEMENT

EXHIBIT D12

SOUTH APPROACH PAVEMENT PATCH

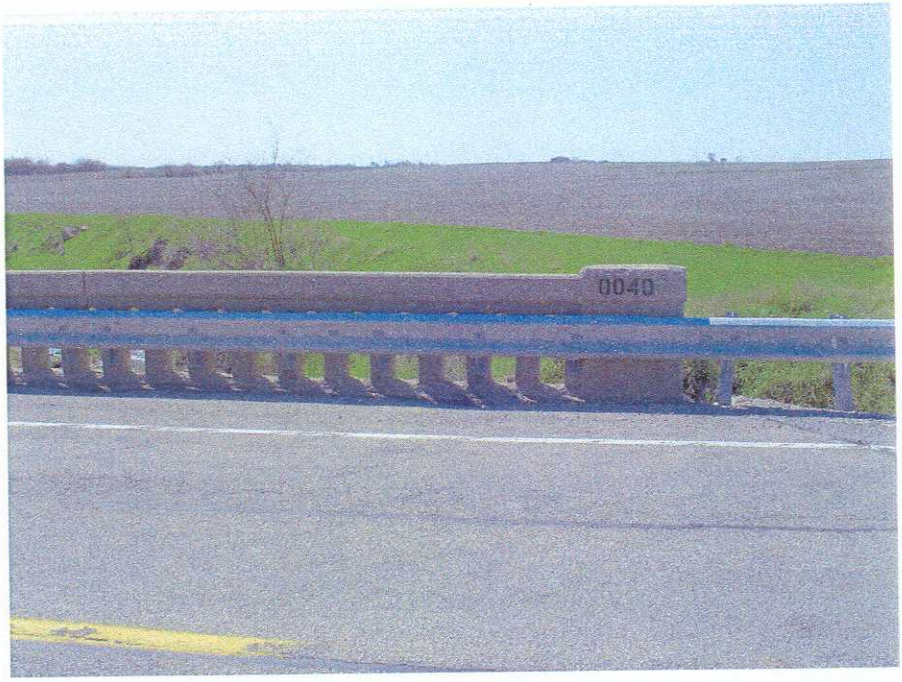
NORTH APPROACH PAVEMENT

EXHIBIT D13

NORTH END OF EAST BRIDGE RAIL

SOUTH END OF EAST BRIDGE RAIL

EXHIBIT D14



NORTH END OF WEST BRIDGE RAIL

SOUTH END OF WEST BRIDGE RAIL

EXHIBIT D15

TYPICAL DECK DRAIN

WEST FASCIA

EXHIBIT D16

EAST FASCIA

TYPICAL GUARDRAIL & TERMINAL END (looking north)

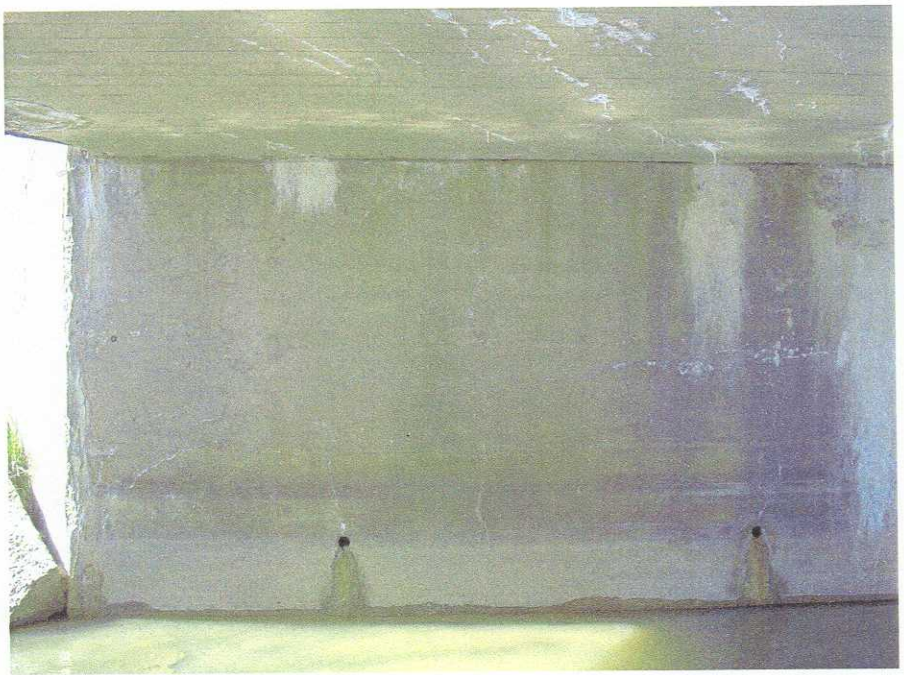
EXHIBIT D17

SOUTH ABUTMENT (west section) (1 of 3)

SOUTH ABUTMENT (center section) (2 of 3)

EXHIBIT D18

SOUTH ABUTMENT (east section) (3 of 3)



NORTH ABUTMENT (west section) (1 of 3)

EXHIBIT D19

NORTH ABUTMENT (center section) (2 of 3)

NORTH ABUTMENT (east section) (3 of 3)

EXHIBIT D20

UNDERDECK (south end) (looking east)

UNDERDECK (north end) (looking east)

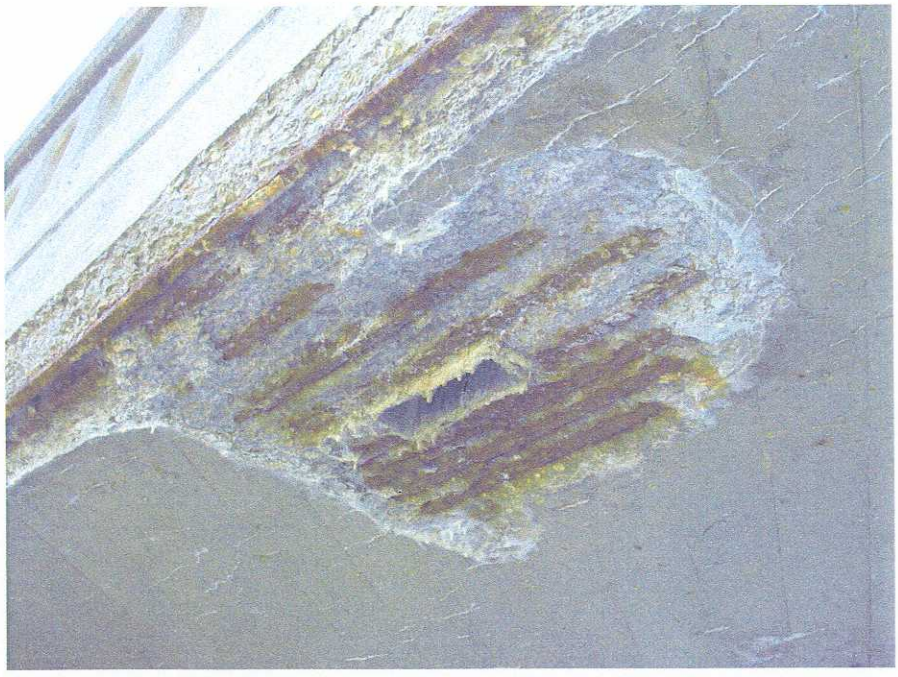
EXHIBIT D21

UNDERDECK (south end) (looking west)

UNDERDECK (north end) (looking west)

EXHIBIT D22

SPALLING AT NORTHEAST WINGWALL AND FASCIA



TYPICAL SPALLING AROUND DECK DRAINS

EXHIBIT D23

TYPICAL WEEP HOLE

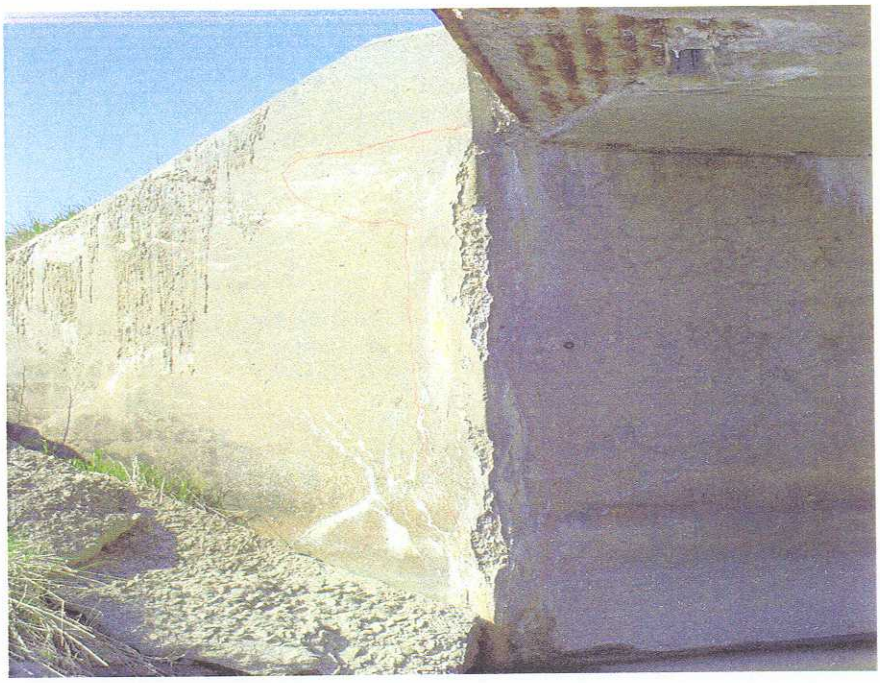
TYPICAL SPALL AND MAP CRACKING WITH
EFFLORESCENCE IN UNDERDECK

EXHIBIT D24

SPALL ON WEST FASCIA AND UNDERDECK

SPALL ON SOUTH EAST WINGWALL / ABUTMENT

EXHIBIT D25



SPALL AND HOLLOW AREA ON NORTHEAST WINGWALL

EXHIBIT D26

APPENDIX E

COST ESTIMATE

STAGE TRAFFIC CROSS SECTIONS

PROPOSED BRIDGE DRAWING

PROPOSED PLAN AND PROFILE

COST ESTIMATE
STRUCTURE REPLACEMENT
STRUCTURE NO. 027-0040

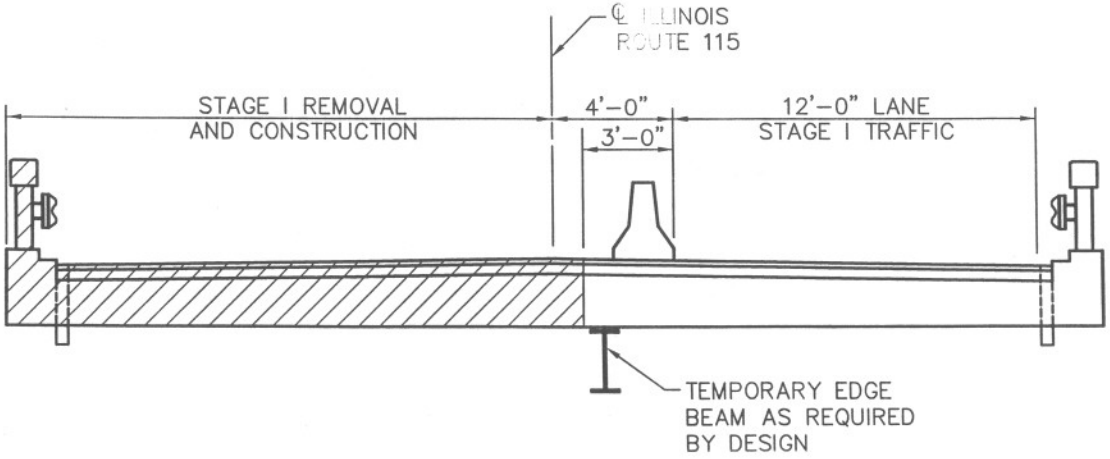
ITEM	UNIT	QUANTITY	UNIT COST	COST
TRAFFIC CONTROL	L SUM	1	$50,000	$50,000
TEMPORARY CONCRETE BARRIER	FOOT	250	$15	$3,750
RELOCATE TEMPORARY BARRIER	FOOT	250	$5	$1,250
TEMPORARY SHEET PILING	SQ FT	1024	$20	$20,480
SUPERSTRUCTURE CONCRETE REMOVAL	CU YD	97	$200	$19,400
SUBSTRUCTURE CONCRETE REMOVAL	CU YD	111	$300	$33,300
PAVEMENT REMOVAL	SQ YD	907	$15	$13,605
REMOVE AND REERECT SPBGR	FOOT	400	$15	$6,000
SPBGR TERMINAL SECTION TYPE I (SPECIAL)	EACH	4	$3,500	$14,000
SPBGR TERMINAL SECTION TYPE 6	EACH	4	$1,800	$7,200
CONCRETE APPROACH PAVEMENT	SQ YD	217	$200	$43,400
PCC CONNECTOR PAVEMENT	SQ YD	27	$100	$2,700
STONE RIPRAP	SQ YD	640	$35	$22,400
TEMPORARY BITUMINOUS WIDENING	SQ YD	614	$35	$21,490
AGGREGATE SHOULDERS	SQ YD	333	$10	$3,330
STRUCTURE COST *	SQ FT	2532	$130	$329,160
EMBANKMENT RESHAPING/GRADING	L SUM	1	$20,000	$20,000
TOTAL REPLACEMENT COST				**$611,465**

*** STRUCTURE AREA = 72' X 35.17' = 2532 S.F.**

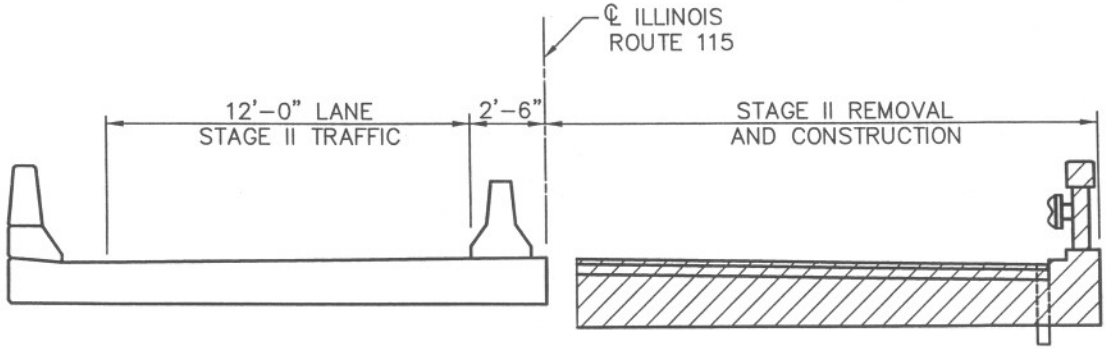
OATES ASSOCIATES

ILLINOIS ROUTE 115
OVER UNNAMED STREAM
S.N. 027-0040

EXHIBIT
E1



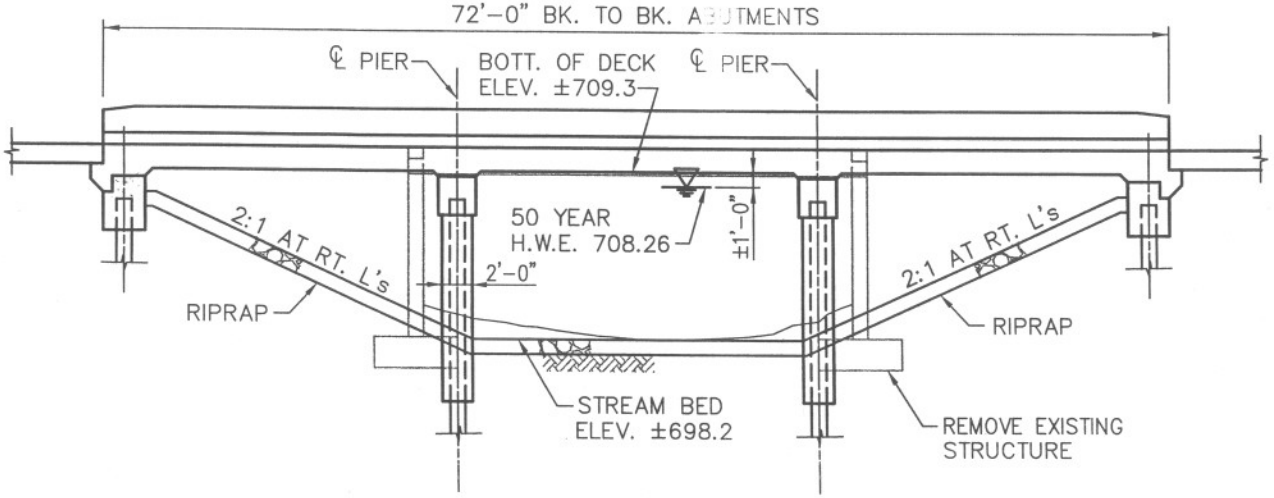
STAGE I



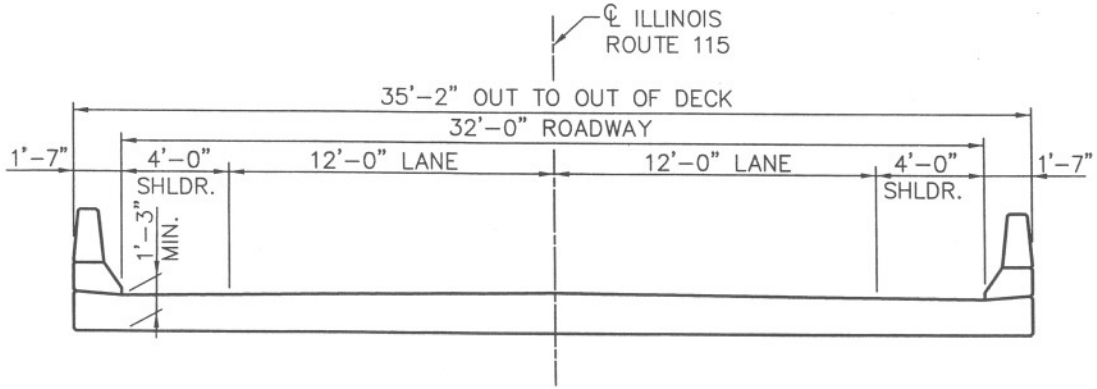
STAGE II

STAGE TRAFFIC CROSS SECTIONS

OATES ASSOCIATES	ILLINOIS ROUTE 115 OVER DRAINAGE DITCH S.N. 027–0040	EXHIBIT E2



PROPOSED BRIDGE DRAWING



CROSS SECTION

STRUCTURE DATA

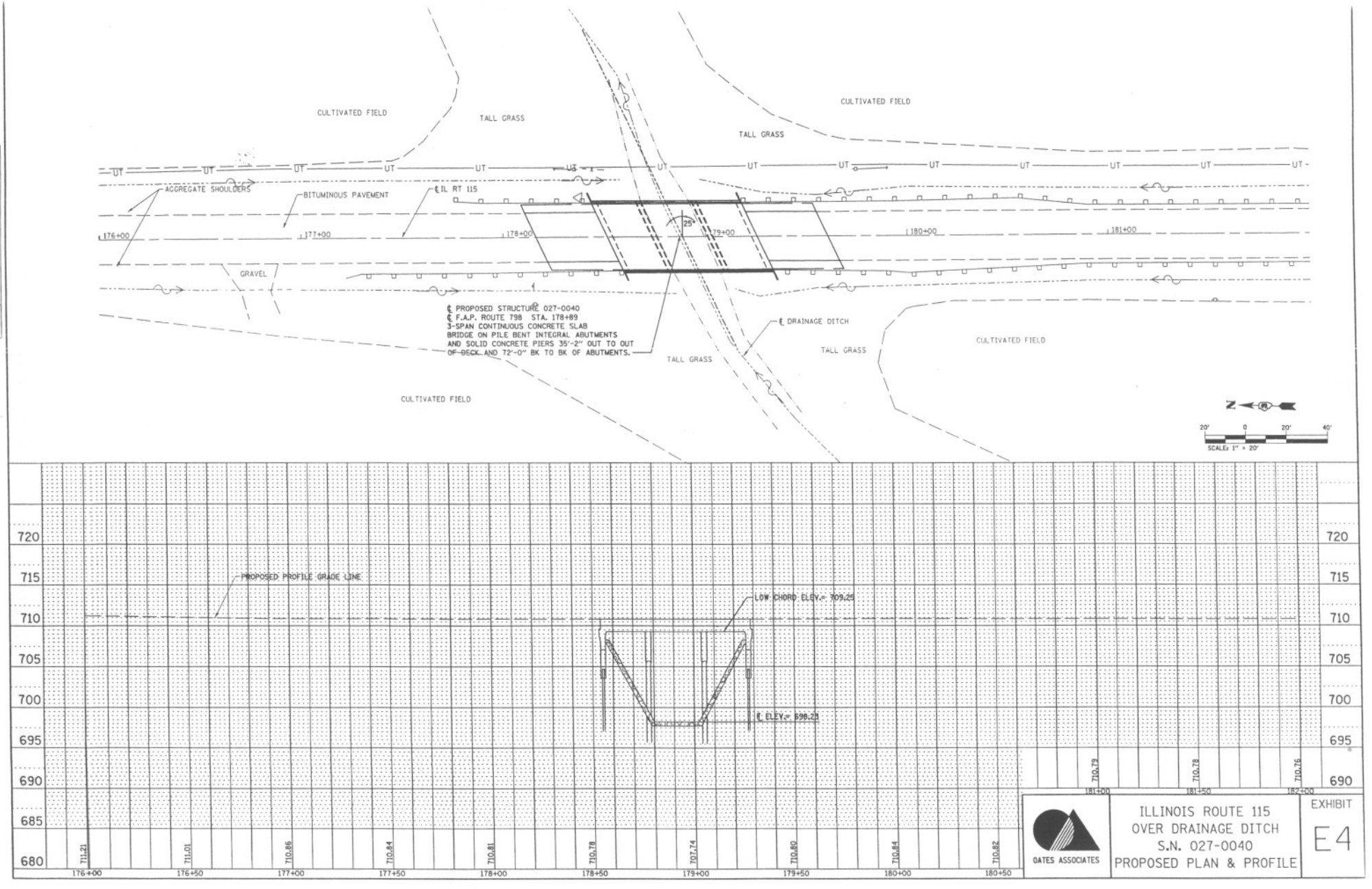
TYPE:	STREAM CROSSING
NUMBER OF SPANS:	3
APPROXIMATE LENGTH:	72'-0"
ABUTMENT TYPE:	INTEGRAL
PIER TYPE:	SOLID
SKEW:	25°
HORIZONTAL CURVE:	NONE
SUPERELEVATION:	NONE
VARIABLE WIDTH:	NONE

NOTE: THE ABUTMENT AND PIER LOCATIONS, DECK THICKNESS AND PROFILE GRADE ARE SUBJECT TO REFINEMENT IN THE TS&L STAGE.

OATES ASSOCIATES

ILLINOIS ROUTE 115
OVER DRAINAGE DITCH
S.N. 027-0040

EXHIBIT
E3



OATES ASSOCIATES

ILLINOIS ROUTE 115
OVER DRAINAGE DITCH
S.N. 027-0040
PROPOSED PLAN & PROFILE

EXHIBIT
E4